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December 12, 2003

Vernay Laboratories, Inc.
120 College Street
Yellow Springs, Ohio 45387-1623

Attention: Mr. Doug Fisher

Reference: Technical Memorandum No. 2
Historical Data Usage in the RCRA Corrective Action
Project No. 0292.11.25

Dear Mr. Fisher:

The Payne Firm, Inc. has prepared the *RCRA Corrective Action, Technical Memorandum No. 2, Historical Data Usage in the RCRA Corrective Action*, dated December 12, 2003, which is attached to this letter. We have prepared this report following guidelines in the United States Environmental Protection Agency's May 8, 1998 *Region 5 Policy and Guidance Regarding Historical Data Usage in the RCRA Facility Investigation*. Please call us if you have any questions.

Sincerely,

The Payne Firm, Inc.

David C. Contant
Project Manager

Daniel D. Weed, C.P.G.
Principal

DCC:DDW:amu

Enclosures

VERNAY

...committed to innovation.

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December 12, 2003

Ms. Patricia J. Polston, Project Manager
Waste Management Branch
United States Environmental Protection Agency
Region 5
Corrective Action Section, DW-8J
77 West Jackson
Chicago, Illinois 60604

Re: **Historical Data Usage**
Vernay Laboratories, Inc. Corrective Action
Yellow Springs, Ohio

Dear Ms. Polston

Vernay Laboratories, Inc. (Vernay) is requesting that the United States Environmental Protection Agency (US EPA) complete a Quality Assurance Project Plan review of past site investigation data collected in and around Vernay's property located at 875 Dayton Street (Facility). The data was collected from 1998 to 2001 during a voluntary investigation conducted by Vernay in compliance with the Ohio Environmental Protection Agency (Ohio EPA) Voluntary Action Program (Ohio VAP) rules. We propose to utilize this data in the Resource Conservation and Recovery Act (RCRA) Corrective Action consistent with its intended purposes.

Vernay collected a considerable amount of data during the Ohio VAP investigation (including ground water, surface water, soil, sediment, and air matrices), which was presented to the US EPA in the November 25, 2002 Current Conditions Report (CCR), along with documentation supporting the quality of the data (e.g. data validation memoranda, analytical reports, data summary tables, and data collection objectives). In the September 27, 2002 Administrative Order on Consent (Consent Order) between the US EPA and Vernay, it was agreed that Vernay would submit a CCR.

The Ohio VAP investigation data assisted in establishing Section VI. of the Consent Order (Work To Be Performed) and the data quality objectives for the RCRA corrective action investigation. Attached to this letter is the RCRA Corrective Action Technical Memorandum No. 2 prepared by The Payne Firm, Inc. (Payne Firm) that includes the following to assist the US EPA with its review process:

1. The relationship and connectivity between the data quality objectives (DQOs) for the Ohio VAP investigation and the RCRA corrective action DQOs.

2. The required information cited in the US EPA's Region 5 Policy and Guidance Regarding Historical Data Usage in the RCRA Facility Investigation (Guidance Document).

Vernay requests a review of the past data. If you have any questions regarding this request, or the information presented in the attached technical memorandum, please contact me or David Contant of the Payne Firm.

I, in my capacity as the Environmental Affairs and Safety Manager for Vernay, and as the designated Project Manager for Vernay in Section V, Paragraph 8 of the Consent Order, certify under penalty of law that this document and all attachments were prepared under my direction or supervision according to a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Sincerely,

Douglas L. Fisher

Douglas L. Fisher
Environmental Affairs and Safety Manager
Vernay Laboratories, Inc.

cc: Mr. David C. Contant - The Payne Firm, Inc.
Mr. Allen Debus - US Environmental Protection Agency
Joseph Lonardo, Esq. - Vorys, Sater, Seymour and Pease

RCRA CORRECTIVE ACTION
TECHNICAL MEMORANDUM NO. 2
HISTORICAL DATA USAGE
IN THE RCRA CORRECTIVE ACTION

VERNAY LABORATORIES, INC.
Plant 2/3 Facility
Yellow Springs, Ohio

Project No. 0292.11.25

December 12, 2003

Prepared For

VERNAY LABORATORIES, INC.
Yellow Springs, Ohio

Prepared By

THE PAYNE FIRM, INC.
11231 Cornell Park Drive
Cincinnati, Ohio 45242
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LIST OF ACRONYMS

AOC	Area of Concern
CCR	Current Conditions Report
COC	Chemical of Concern
Consent Order	Administrative Order on Consent
DQO	Data Quality Objective
Facility	Vernay's Property Located at 875 Dayton Street
MDL	Method Detection Limit
Ohio EPA	Ohio Environmental Protection Agency
Ohio VAP	Ohio EPA Voluntary Action Program
Payne Firm	The Payne Firm, Inc.
PQL	Practical Quantitation Limit
Project QAPP	Quality Assurance Project Plan for the RCRA Corrective Action
RCRA	Resource Conservation and Recovery Act
Ohio VAP QAPP	Quality Assurance Project Plan for the Ohio Voluntary Action Program
QA/QC	Quality Assurance/Quality Control
SOP	Standard Operating Procedure
SOW	Statement of Work
STL	Severn Trent Laboratories, Inc.
SWMU	Solid Waste Management Unit
US EPA	United States Environmental Protection Agency
Vernay	Vernay Laboratories, Inc.
VOC	Volatile Organic Compound

1.0 INTRODUCTION

Vernay Laboratories, Inc. (Vernay) is requesting that the United States Environmental Protection Agency (US EPA) complete a Quality Assurance Project Plan (QAPP) review of all of the past site investigation data collected by The Payne Firm, Inc. (Payne Firm) in and around Vernay's property located at 875 Dayton Street (Facility). The data was collected from 1998 to 2001 during a voluntary investigation conducted by Vernay following the Ohio Environmental Protection Agency (Ohio EPA) Voluntary Action Program (Ohio VAP) rules. We propose to utilize this data in the Resource Conservation and Recovery Act (RCRA) Corrective Action consistent with its intended purposes.

The Payne Firm, on the behalf of Vernay, collected a considerable amount of data during the Ohio VAP investigation (including ground water, surface water, soil, sediment, and air matrices), which was presented to the US EPA in its entirety in the November 25, 2002 Current Conditions Report (CCR), along with documentation supporting the quality of the data (e.g. data validation memoranda, analytical reports, data summary tables, and data collection objectives). The CCR was agreed to be completed by the September 27, 2002 Administrative Order on Consent (Consent Order) between the US EPA and Vernay. The Ohio VAP investigation assisted in establishing Section VI. of the Consent Order (Work To Be Performed) and the data quality objectives for the Resource Conservation and Recovery Act (RCRA) corrective action investigation.

Appendix A of the US EPA's Region V QAPP policy (US EPA, 1998) provides guidance on conducting a step-wise approach in determining the acceptability and use of past data relative to RCRA corrective action decision-making. The step-wise approach consists of the following:

Step 1: Definition of Vernay RCRA corrective action data quality objectives (DQOs).

Step 2: Identification of the criteria that must be met before past data can be determined to be acceptable for use in the RCRA corrective action.

Step 3: Application of the criteria to determine whether or not the past data actually satisfies the RCRA corrective action DQOs and whether the data should be submitted to the US EPA.

Step 4: Submittal of the following information to the US EPA.

- A detailed description of what information Vernay intends to submit.
- A rationale as to what purpose the data is intended to serve, and why Vernay believes the data can meet these objectives.

- A detailed discussion of all activities, releases, and/or other changes at the Vernay facility that have (or could have) affected the location, nature, and/or concentration of hazardous constituents at solid waste management units under consideration, from the date(s) the historical data was generated until the present.

Step 5: Review of the historical data package by the US EPA.

Steps 1 through 4 of this process are presented below. For Step 5, the location of where the US EPA can find the important components associated with the review of the historical data package is provided on Table 1.

2.0 STEP 1: VERNAY RCRA CORRECTIVE ACTION DATA OBJECTIVES

Since the Consent Order negotiated by the US EPA and Vernay is a streamlined order and does not require the preparation of a RCRA Facility Investigation Work Plan, the project DQOs were initially defined in Table 1 (Project DQO Table) of the Payne Firm's February 11, 2003, *Quality Assurance Project Plan for the Vernay Laboratories, Inc. RCRA Corrective Action* (Project QAPP) to assist in the initial scoping of the RCRA corrective action. The Project DQO Table has been revised to more clearly demonstrate the intended use of the Ohio VAP investigation data during the RCRA corrective action. The revised Project DQO table is presented on Table 2.

The basis for the rational presented in the Project DQO Table is Section VI. of the Consent Order, the CCR, and US EPA guidance (US EPA, 1998; US EPA, 2000). Consistent with US EPA DQO guidance (US EPA, 2000), Ohio VAP investigation data is being used to support and meet certain Project DQOs during the RCRA corrective action.

The Ohio VAP investigation began the process of characterizing the nature and extent of contamination beneath the Facility and off of the Facility, including the initial stage of ground water capture and treatment. The data was collected using acceptable field sampling methods, and analyzed using US EPA laboratory methods and procedures.

As a result, the data was used to develop the scope of work presented in Section VI. of the Consent Order, and this has resulted in specific end uses of the data. The basis for this continuity is summarized in Steps 2, 3, and 4 below. The intended purpose of the Ohio VAP investigation data within the Project DQO process is presented in Table 2, as indicated above. The Analytical Level and intended use of the Ohio VAP data during the RCRA corrective action based on a media-specific overview is presented in Table 3.

3.0 STEP 2: IDENTIFICATION OF CRITERIA THAT MUST BE MET

An essential step in the evaluation of the Ohio VAP investigation data is determining its reliability and acceptability. As summarized below, it is the opinion of the Payne Firm that the Ohio EPA VAP investigation data is acceptable for its intended uses during the RCRA corrective action based on the following criteria:

- There were DQOs in place during the Ohio VAP investigation that ensured that data collected for the characterization of environmental conditions were the appropriate type and quality for their intended uses.
- There was a QAPP (Ohio VAP QAPP) in place that presented the organization, objectives, functional activities, and specific quality assurance/quality control (QA/QC) activities associated with the Ohio VAP investigation.
- A US EPA data validation process was used to ensure and document that the analytical data generated during the Ohio VAP investigation were what the project laboratory purported them to be.
- The US EPA SW846 analytical methods required by the Ohio VAP QAPP are the same methods required by the Project QAPP. In addition, Severn Trent Laboratories, Inc. (STL), North Canton, Ohio, is the laboratory that is being used during the RCRA corrective action; it was also the laboratory that was used during the Ohio VAP investigation.
- Ground water, surface water, and sediment data generated during the Ohio VAP investigation are sufficient for its intended purposes under the RCRA corrective action because it is comparable to RCRA corrective action data (Appendices VII and VIII). It is assumed at this point that Ohio VAP Analytical Level III soil data is also comparable to RCRA corrective action data. This assumption will be verified by collecting confirmatory samples during the RCRA corrective action.
- CLP-like data packages required by the Project QAPP could be obtained from STL for all of the Ohio VAP Analytical Level III data, if needed.
- The targeted practical quantitation limits (PQLs) required by the Ohio VAP QAPP are very comparable to the PQLs required by the Project QAPP, as summarized on Table 4.
- The set of QC samples required by the Ohio VAP QAPP is the same set required by the Project QAPP (except for matrix spike/matrix spike duplicate). Both QAPPs require that the general level QC effort will be the collection of one set of QC samples per 20 investigative samples.

4.0 STEP 3: ASSESSMENT OF ADEQUACY OF PAST DATA

An assessment of the criteria referenced in Step 2 is discussed below. The objective of this assessment is to demonstrate that the Ohio VAP investigation data satisfies the Project DQOs, and to demonstrate that the data should be submitted to the US EPA for review.

4.1 Ohio VAP Data Quality Objectives

Beginning in 1998, Vernay conducted a number of investigations at and in the vicinity of the Facility following the Ohio VAP investigation rules in Ohio Administrative Code (OAC) 3745-300. A Draft VAP Phase I Property Assessment (Phase I) was prepared by the Payne Firm on March 16, 1999 that documented releases or suspected releases of hazardous substances and petroleum at the Facility. The Phase I assisted in focusing the scope of work of the Ohio VAP site investigation, and was the basis for US EPA's 2001 preliminary assessment/visual site inspection (TechLaw, 2001). The Ohio VAP site investigation was conducted in iterative phases from 1998 through 2001, as summarized in Table 1 of the CCR.

The Ohio VAP rules require the volunteer to investigate areas of suspected or known releases to determine the extent of contamination for identified chemicals of concern. During this period, samples of soil, ground water, surface water, sediment, and air were collected in accordance with Ohio VAP sampling procedures, and analyzed by an Ohio VAP-certified analytical laboratory (STL). In addition, ground water capture well and treatment systems were installed to stabilize the migration of volatile organic compounds (VOCs) at or from the Facility. Detailed discussions of this Ohio VAP site investigation were presented in Section 4.0 of the CCR.

During the Ohio VAP investigation, a systematic planning approach was implemented to ensure that appropriate sampling procedures were employed, and that data collected were of the appropriate type and quality for their intended use. This systematic approach included the development of DQOs that were consistent with US EPA DQO guidance (US EPA, 1993) as required by Ohio VAP rule 3745-300-07 (F) (see Appendix I).

The Ohio VAP DQOs were summarized in Section 4.3 of the CCR. The DQOs established for the Ohio VAP (Ohio VAP DQOs) investigation were at a minimum: 1) consistent with the sampling objectives; 2) defined the most appropriate types of samples to collect; 3) determined the most appropriate conditions from which to collect the samples; 4) defined the quality and quantity of samples to be collected; and 5) specified tolerable limits on decision errors that were used as the basis for establishing the quantity and quality of the data needed to support decisions.

4.2 Ohio VAP QAPP, Standard Operating Procedures, and VAP-Certified Laboratory

For the Ohio VAP investigation, a project QAPP was prepared by the Payne Firm that established acceptable QA/QC procedures when collecting field data, laboratory data quality procedures, and data validation procedures (Payne Firm, 1998). The QA/QC procedures defined in the QAPP ensured that the field and analytical data met specified goals of accuracy, precision, completeness, and representativeness. A copy of the Ohio VAP QAPP is presented in Appendix II. The primary components that were used by the Payne Firm to ensure that the objectives and procedures of the Ohio VAP QAPP were adhered to were:

- Payne Firm Standard Operating Procedures (SOPs) that define sample collection (i.e. handling, custody, packing and shipping, preservation, and holding times), field instrument screening techniques, sampling techniques, documentation, instrument calibration, equipment decontamination. Applicable Payne Firm SOPs are cited in the Ohio VAP QAPP. The field SOPs used by the Payne Firm during the Ohio EPA VAP investigation are being used during the RCRA corrective action (see Appendix II of the Project QAPP).
- Consistent with the Consent Order, the Ohio VAP investigation did not require the preparation of a work plan. Prior to initiating an Ohio VAP sample collection activity, the Payne Firm prepared a task-specific Statement of Work (SOW) that documented the: 1) objectives and purpose of the task; 2) data collection methodology; 3) sample identification, containers, preservation, and analytical methods; and 4) number and quantity of QC samples. This practice was employed so that the field

sampling team was fully aware of the requirements of the task. This practice is continuing during the RCRA corrective action project to maintain sampling collection consistency, and to meet the Project DQOs. Ten Ohio VAP SOWs were prepared during the Ohio VAP investigation.

- During the Ohio VAP investigation, one set of QC samples per 20 or fewer investigative samples were collected. A summary of QC samples collected during the Ohio VAP investigation was presented on Table 9 in the CCR, which included the following set of samples: field duplicate, field equipment rinseate, field blank, and trip blank. This level of frequency is continuing during the RCRA corrective action (see Section 4.1 of the Project QAPP). In addition to the suite of QC samples analyzed for during the Ohio VAP, the Project QAPP includes the analysis of a matrix spike/matrix spike duplicate sample.
- As required by Ohio VAP rule 3745-300-04 (Appendix III), an Ohio VAP-certified laboratory was used to analyze all samples collected during the Ohio VAP investigation (1998 to 2001; site investigation samples were not collected in 2002 because of settlement negotiations with a Plaintiff's litigation group, and Consent Order negotiations with the US EPA). During the Ohio VAP investigation, STL was utilized as the Ohio VAP-certified laboratory as described in a November 3, 2003 letter from STL to the Payne Firm (Appendix IV). STL has continued on as the project laboratory for the RCRA corrective action.
- Samples collected for laboratory analyses during the Ohio VAP investigation were analyzed using USEPA SW846 Methods. STL's laboratory-specific SOPs for SW846 methods utilized during the Ohio VAP investigation are the same SOPs that STL is using to analyze RCRA corrective action samples. As stated in STL's November 3, 2003 letter (Appendix IV), STL's laboratory SOPs have been reviewed and approved by the US EPA many times as part of STL's QAPP process.
- Table 4 presents a comparison between the targeted PQLs for the Ohio VAP and the RCRA corrective action. This table indicates that the targeted PQLs are the same for the majority of the constituents.
- Tables 5 and 6 of the Project QAPP present the accuracy and precision requirements for the SW846 laboratory methods in terms of MS/MSD recovery and RPD control limits, and surrogate compound control limits. The acceptance criteria presented in Tables 5 and 6 is based on the level of QC effort specified the US EPA's "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW846, 3rd Edition, 1996 (US EPA, 1996), and STL's laboratory SOPs. According to STL, the acceptance criteria used during the Ohio VAP is not significantly different than what it is for the RCRA corrective action because: 1) the procedures for conducting SW846 methods have not been updated since 1996; 2) nor has STL's SOPs significantly changed. As stated in STL's November 3, 2003 letter (Appendix IV), STL North Canton has worked closely with US EPA Region 5's QAPP managers over the years to ensure that STL's quality systems, analytical processes, and SOPs comply with Region V's requirements.
- Data analyzed by STL was validated by the Payne Firm during the Ohio VAP investigation (as discussed in Section 4.3). As presented in the data validation memoranda in Appendix V, all of the Ohio VAP investigation data was useable for its intended VAP investigation purposes. None of the data was rejected by the data validation process. However, some of the data was qualified by the Payne Firm validation coordinator as estimated due to minor departures from QC acceptance criteria.

Data qualified by the Payne Firm as estimated will be assessed within the uncertainty analysis of the risk assessment and contaminant fate and transport modeling during the RCRA corrective action.

4.3 Data Validation

During the Ohio VAP investigation, laboratory analytical reports were submitted to the Payne Firm in hard copy and in an electronic format by STL. The electronic version of these completed reports was presented in Appendix III of the CCR. After each phase of work, the laboratory data and reports were independently validated by the Payne Firm following US EPA guidance for organic and inorganic data review (US EPA, 1999). This process was documented in data validation memoranda prepared by the Payne Firm, which were presented in Appendix X of the CCR and are included in Appendix V.

To verify that the analytical data met its intended uses, the validation process included, at minimum, a review of the following: laboratory adherence to QA procedures; holding time periods; reporting limits; method blank samples; system monitoring compounds/surrogate spikes; laboratory control samples, and any non-conformities or discrepancies in the analytical database. Additional information, such as identification of specific dates, locations, and depths of samples in all media, sample identification, and analytical parameters and methods are also included in the data validation memoranda.

After the validation was completed, data qualifiers were assigned to the analytical database to notify the user of any non-conformity to the QA/QC requirements set forth in the Ohio VAP QAPP. The validation procedures followed US EPA guidance (US EPA, 1999). The use of these procedures is continuing during the RCRA corrective action as required by Section 10.0 of the Project QAPP.

4.4 Required DQO Analytical Level

The DQO Analytical Level required during the Ohio EPA VAP investigation depended on the intended use of the data. As such, different data uses required different levels of data quality. As presented in Section 4.3 and Table 10 of the CCR, there were five Analytical Levels for the Ohio VAP investigation that addressed various data uses and the QA/QC effort and methods required to achieve the desired level of quality. Table 10 of the CCR is presented in Appendix VI.

As discussed in Section 2.2 of the Project QAPP, the RCRA corrective action utilizes the same five Analytical Levels as the Ohio VAP. In addition, the US EPA SW846 analytical methods used during the Ohio VAP investigation are continuing to be used during the RCRA corrective action as shown on Table 5. The only difference with the Ohio VAP QAPP was that all organic and inorganic data collected at monitoring well, soil boring, surface water, sediment, and air sampling locations were required to be reported as Analytical Level III data, as summarized in Section 4.3 and Table 10 of the CCR. For the RCRA corrective action, the Project QAPP requires the analytical results to be reported as CLP-like data.

Analytical Level III data generated during the Ohio VAP is quantitative data where the laboratory analyses were generated with full QA/QC checks of types and frequencies typically specified for Analytical Level IV data (US EPA, 1987; 1991). Analytical Level III data is sufficient to characterize the nature and extent of contamination of ground water, soil, surface water, sediments, and air, to perform a risk assessment following US EPA guidance (US EPA, 1989), determine contaminant fate and transport, and perform an evaluation of remedial alternatives (US EPA, 1987).

As required by Section 3.1 of the Ohio VAP QAPP, and described in the November 3, 2003 letter from STL, the Analytical Level III data for the Ohio VAP investigation did not contain extended data deliverables (e.g. raw instrument output, bench sheets, etc.), but did include sufficient QC information (e.g. method blanks, laboratory control samples, surrogate and spike recoveries, and Relative Percent Differences) for data validation. As required by the Ohio VAP QAPP, STL retained the information necessary to prepare a CLP-like data packages as stated in STL's November 3, 2003 letter.

4.5 Comparison and Confirmation of Ground Water Data

The Ohio VAP investigation ground water analytical data were compared to the RCRA corrective action ground water laboratory data. The purpose of this comparison was to: 1) determine if there is significant variability in the laboratory method reporting limits; and, 2) determine if there is significant variability in the sample concentrations between the Ohio VAP data and the recent RCRA corrective action data. The empirical methods for comparing confirmatory data with historical data presented in US EPA Region V QAPP guidance (US EPA, 1998) were used.

The results of the comparison are summarized in Appendix VII. The results indicate that there is no significant variability between the method detection limits (MDLs) and in the sample concentrations between the Ohio VAP ground water data and the confirmatory ground water data. As a result, the Ohio VAP ground water data should be able to be used for its intended RCRA corrective action purposes.

4.6 Confirmation of Soil Data

During the Ohio VAP investigation, a large volume of soil data was collected at the Facility. The majority of the data was collected using the methodology required by Appendix B of the US EPA's Region V QAPP guidance (US EPA, 1998). This data is considered to be Analytical Level III data. Appendix B requires that RCRA corrective actions determine volatiles in soil by using sample collection procedures consistent with Methods 5021 or 5035 of Update III to SW-846 (US EPA, 1997). Update III procedures are continuing to be followed during the RCRA corrective action when additional soil investigation data is collected.

Confirmatory soil samples will also be collected during the RCRA corrective action following the procedures presented in Appendix A of the US EPA's QAPP guidance. At least 10% of the Ohio VAP investigation soil data will be confirmed during the RCRA corrective action to satisfy the Project DQOs, which require that Ohio VAP soil data be confirmed. Analysis of the confirmatory data will follow the procedures presented in Appendix A of the US EPA's Region V QAPP.

4.7 Comparison and Confirmation of Surface Water, Sediment, and Air Data

The Ohio VAP investigation surface water and sediment analytical data were compared to the RCRA corrective action surface water and sediment analytical data. The purpose of this comparison was to: 1) determine if there is significant variability in the laboratory method reporting limits; and 2) determine if there is significant variability in the sample concentrations between the Ohio VAP investigation data and the recent RCRA corrective action data. The empirical methods for comparing confirmatory data with historical data presented in US EPA Region V QAPP guidance (US EPA, 1998) were used.

The results of the comparison are summarized in Appendix VIII. The results indicate that there is no significant variability between the MDLs and in the sample concentrations between the Ohio VAP investigation surface water and sediment analytical data and the confirmatory surface water and sediment data. As a result, the Ohio VAP surface water and sediment data should be able to be used for its intended RCRA corrective action purposes.

Six air samples were collected during the Ohio VAP investigation using Summa™ canisters. The samples were analyzed by STL in Knoxville, Tennessee. The purpose of collecting the samples was to determine if there was a risk of concern in belowground structures beneath Plants 2 and 3. The data was analyzed using US EPA Method TO-14 and is Analytical Level III data. The data will be used during the risk assessment screening portion of the RCRA corrective action to evaluate if additional air samples are needed to meet the human health environmental indicator. If additional air samples are not needed, the Ohio VAP investigation air data will be used to meet the human health environmental indicator.

5.0 STEP 4A: DESCRIPTION OF SUBMITTED DATA

A description of the data submitted for US EPA review is presented in Appendix IX. The data includes soil, ground water, surface water, sediment, air, and geological property data.

6.0 STEP 4B: PURPOSE OF THE OHIO VAP INVESTIGATION DATA

As discussed in Step 2, the purpose of the Ohio VAP investigation data within the RCRA corrective action is summarized on Tables 2 and 3. Ground water data collected from permanent monitoring wells during the Ohio VAP investigation is Analytical Level III data. This data will be used during the RCRA corrective action to assist in developing scopes of work for characterizing the nature and extent of contamination, evaluate trends in the concentrations of chemicals of concern (COCs) over time, assess contaminant fate and transport, determine COCs, and to evaluate the effectiveness of existing ground water interim measures.

Ground water samples collected from Geoprobe soil borings during the Ohio VAP investigation is considered Analytical Level III data, and will be used to assess the nature and extent of ground water contamination and contaminant fate and transport during the RCRA corrective action.

Soil data collected during the Ohio VAP investigation is Analytical Level III data. This will be confirmed during the RCRA corrective action, as discussed above. The Ohio VAP investigation soil data will be used to assist in the characterization of the nature and extent of soil contamination, vadose zone modeling (if necessary), the risk assessment, and the evaluation of corrective measures. Saturated soil samples will be used to qualitatively assess whether or not VOCs have impacted any saturated sand seams beneath the Facility.

Geological property soil data collected during the Ohio VAP investigation, which is Analytical Level V data, will be used to characterize the hydrogeological properties of the deposits beneath the Facility, in vadose zone and contaminant fate and transport modeling, the risk assessment, and the corrective measures evaluation.

Surface water and sediment Ohio VAP investigation data, which is Analytical Level III data, will be used to assist in the characterization of the nature and extent of contamination in surface water and sediment on and off the Facility, evaluate trends in the concentrations of COCs over time, the risk assessment, and the evaluation of corrective measures.

Air data is Analytical Level III data and will be used for the risk assessment.

7.0 STEP 4C: CHANGES IN FACILITY CONDITIONS

There are no activities, releases, and/or other changes at the Facility that have, or could have, affected the location, nature, and/or concentration of hazardous constituents at the identified solid waste management units (SWMUs) and Areas of Concern (AOCs) under consideration, from the time period that the Ohio VAP data was generated (beginning in the Fall 1998) until the date of this Technical Memorandum. This is based on the following:

- There has not been a spill of chemicals at the Facility since June 1998. This spill consisted of a leak of hydraulic oil from a pipe into the hydraulic oil pipe trench system. The hydraulic oil pipes are contained within a concrete trench system with several concrete containment sumps to provide for secondary containment in case of leaks. Approximately 150 gallons of hydraulic oil were recovered in a sump located in the concrete trench system in June 1998.
- The locations of the majority of SWMUs and AOCs documented in the PA/SVI (TechLaw, 2001) are within buildings or on pavement thus minimizing the amount of infiltration from precipitation into contaminated soil beneath the Facility.
- The Facility has significantly reduced its manufacturing operations since the beginning of 2002 to the point where there are currently no manufacturing operations in Plant 3, and limited manufacturing operations in Plant 2.
- Ground water results collected during the RCRA corrective action have not significantly increased in comparison to the Ohio VAP investigation data. In fact, concentrations beneath the Facility have decreased due to the capture of ground water along the downgradient eastern property boundary.

8.0 REFERENCES

TechLaw, 2001; Final Preliminary Assessment/Visual Site Inspection Report for Vernay Laboratories, Inc., 875 Dayton Street, Yellow Springs, Ohio; EPA ID No. OHD004243002.

The Payne Firm, Inc.,1998; Quality Assurance Project Plan, Voluntary Action Program, Phase II Property Assessment, Vernay Laboratories, Inc., Plant 2/3 Property, Yellow Springs, Ohio; Project No. 0109.59.12.

The Payne Firm, Inc., 2002, Current Conditions Report, Vernay Laboratories, Inc., Plant 2/3 Facility, Yellow Springs, Ohio; November 25, 2002; Project No. 0292.11.07.

United Stated Environmental Protection Agency, 1987; Data Quality Objectives for Remedial Response Activities, Example Scenario, RI/FS Activities at a Site With Contaminated Soil and Ground Water; Office of Emergency and Remedial Response; Washington, D.C.; EPA/540/G-87/004.

United Stated Environmental Protection Agency, 1989; Risk Assessment Guidance for Superfund: Volume 1, Human Health Evaluation Manual, RAGs Part A; EPA/540/-89/002; Office of Solid Waste and Emergency Response; United Stated Environmental Protection Agency, Washington, D.C.

United Stated Environmental Protection Agency, 1993; Data Quality Objectives Process for Superfund; September 1993.

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United Stated Environmental Protection Agency, 1998; RCRA QAPP Policy: Region V; Revision: April 1998; Office of Waste, Pesticides and Toxics Division; Chicago, Ill.

United Stated Environmental Protection Agency, 1999; United Stated Environmental Protection Agency Contract Laboratory National Functional Guidelines for Organic and Inorganic Data Review; EPA-540/R-94-012 and EPA-540/R-94-013.

United Stated Environmental Protection Agency, 2000; Guidance for the Data Quality Objective Process, EPA QA/G-4; EPA/600/R-96/055; Office of Environmental Information; Washington, D.C.

The Payne Firm, Inc.

Vernay Laboratories, Inc.

Plant 2/3 Facility

Project No. 0292.11.25

TABLE 1: Location of Data Package Review Components

Data Package Review Component	Location of Information
Identification of specific dates, locations, and depths of samples in all media	
ground water	CCR Table 2, 4, 5, 6, 7, 12, 13, 25, 26, 27, CCR Figure 24, 25, 26, 27; CCR Appendix III
surface water	CCR Table 33, CCR Figure 21, 22; CCR Appendix III
soil	CCR Table 2, 3, 11, 12, 18, 19, 20, 21, 22, 23, 24; CCR Figure 18, 19, 20, 23; CCR Appendix III
sediment	CCR Table 34, CCR Figure 22; CCR Appendix III
air	CCR Section 4.5.1.4; CCR Appendix III
Sampling techniques utilized, including well construction information	CCR Section 4.1.2, 4.3, Payne Firm SOPs; CCR Table 37; CCR Appendix VI
Sample collection, preservation, and transportation practices	Ohio VAP QAPP (Technical Memorandum No. 2, Appendix II)
Identification of all constituents for which the samples were analyzed	
ground water	CCR Table 27, 28, 29, 30, 31; CCR Appendix III
surface water	CCR Appendix III
soil	CCR Table 18, 19, 20, 21, 22, 23, 24; CCR Appendix III
sediment	CCR Appendix III
air	CCR Appendix III
QC samples and results	CCR Table 9, 27, 28; CCR Appendix III, X
Laboratory acceptability	Appendix IV to Technical Memorandum No. 2
Analytical method documentation	CCR Appendix III
Original analytical laboratory-submitted data package	CCR Appendix III
Data package quality control report	CCR Appendix III
Data reporting (including reporting limits, treatment of non-detects,etc.)	CCR Appendix III, CCR Appendix X

TABLE 2: Project Data Quality Objectives

Step in the DQO Process	Systematic Planning Activities	Intended Purpose of Ohio EPA VAP Investigation Data Within the Planning Activities	Outputs to Support Planning Decisions
1. **State the Problem** **Note:** An important deliverable associated with this step is the preparation of a Current Conditions Report that includes Ohio VAP investigation sampling data, summary of historic operations at the Facility, physical setting of the Facility, review of the quality of Ohio VAP data, and conditions at all locations specified in the US EPA's PA/VSI for the Facility (USEPA, 2000).	• Identify USEPA technical team and Vernay's technical team. • Develop a conceptual model for the Facility. • Identify work performed to date, data collected, problems encountered, project schedule, and percent project completed on a frequent basis. • Communicate frequently with US EPA.	• Ohio VAP data will be used to develop a: 1) conceptual model of the Facility identifying the site geology and potential contaminant migration pathways; and 2) potential human exposure model for on and off of the Facility. The models will serve as the basis for RCRA corrective action scope of work inputs and decisions, especially with regards to Section VI. of the Consent Order (Work To Be Performed).	• Formal identification of project managers once the Consent Order is signed. • Preparation and presentation of a Facility conceptual site model in the Current Conditions Report. • Preparation of a human exposure model that is verbally discussed with US EPA risk assessor. • Preparation of Quarterly Progress Reports that includes an updated project schedule. • Notify the US EPA in writing at least 14 days before beginning each separate phase of field work. • Meet on at least a semi-annual basis to discuss scopes of work. • Establish a public repository.
2. **Identify the Decision** **Note:** Important deliverables for this step is a Historical Data Usage Technical Memorandum; a request to the US EPA for a review of past Ohio VAP investigation analytical data following US EPA guidance (US EPA, 1998); and a project specific QAPP.	• Determine if past Ohio VAP investigation analytical data is usable for RCRA corrective action decision making. • Identify the principal objectives of conducting the work presented in Section VI. of the Consent Order. • Conduct RCRA corrective action in an iterative process to optimize the decision making process. • Identify the specific scopes of work needed to meet the project objectives. • Identify project specific analytical objectives in terms of accuracy, precision, completeness, representativeness, and comparability; and identify data validation process.	• Use Ohio VAP investigation data presented in the CCR and the conceptual models presented in Step 1 to assist in determining principal objectives of specific RCRA corrective action scopes of work, and the data needed to satisfy those objectives.	• Preparation of a Historical Data Usage Technical Memorandum demonstrating why the Ohio VAP investigation analytical data does or does not satisfy the RCRA corrective action DQOs and whether the analytical data should be submitted to the US EPA for review. • A request to the US EPA to review Ohio VAP investigation analytical data to determine if it is acceptable for its intended uses in the RCRA corrective action. • Task-specific Statement of Works that are prepared prior to each iterative field investigation step and sent to the US EPA for review. If needed, a conference call will take place to discuss the scope of work. • Preparation of decision trees or flow diagrams as necessary to define key decisions and possible interim steps. • Preparation of a project specific QAPP following US EPA guidance (US EPA, 1998) and submittal to US EPA for review.

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TABLE 2: Project Data Quality Objectives

Step in the DQO Process	Systematic Planning Activities	Intended Purpose of Ohio EPA VAP Investigation Data Within the Planning Activities	Outputs to Support Planning Decisions
3. **Identify the Inputs Into the Decision** **Note:** Important deliverables for this steps are a: Ground Water Technical Memorandum; Phase I RFI Report; Phase II RFI Report; EI Report for ground water; EI Report for human health; and Corrective Measures Proposal.	• Complete a capture zone analysis. • Complete an assessment of the potential effectiveness of in situ soil treatment beneath the Facility in areas of highest contamination. • Perform an investigation of the Facility to identify the nature and extent of any releases of hazardous waste and hazardous constituents at or from the Facility. • Determine appropriate risk screening criteria under current use scenarios. • Determine any current unacceptable risks to human health and the environment. • Conduct ground water monitoring to confirm that any contaminated ground water remains within the original area of contamination. • Implement any interim measure necessary to stabilize the migration of contaminated ground water. • Control any unacceptable current human exposures to within acceptable risk levels. • Evaluate a range of corrective measures and propose a final remedy that protects human health and the environment from all current and future unacceptable risks.	• Use Analytical Level III Ohio VAP investigation data to complete capture zone analysis (ground water data) and in situ treatment assessment (soil data). • Use Analytical Level III Ohio VAP investigation ground water, soil, surface water, sediment, and air data presented in the CCR to assist in identifying the data needs of the RCRA corrective action. • Use Analytical Level III Ohio VAP investigation ground water, soil, surface water, sediment, and air data to conduct risk screening. • Use Analytical Level III soil data and air monitoring data to determine the nature and extent of contamination, unacceptable risks, contaminant fate and transport modeling (e.g. soil leaching and vapor intrusion modeling), and evaluation of corrective measures. • Use Analytical Level III Ohio VAP investigation ground water data in: trend analyses conducted during the quarterly ground water monitoring program; sensitivity, calibration, and uncertainty analyses for contaminant fate and transport modeling; and, assessment of remedial technologies (e.g. natural attenuation and ground water capture) during the evaluation of corrective measures. • Use Analytical V geological property data to support the evaluation of soil contaminant leaching and vapor intrusion.	• Analytical Level III data will be generated, and it will reported by the project laboratory as a CLP-like report during the RCRA corrective action. • Confirmatory soil samples will be collected and reported at Analytical Level IV to confirm Ohio VAP investigation Analytical Level III soil data results, the nature and extent of soil contamination presented in the CCR, and the PA/VSI. At least 10% of the Ohio VAP investigation soil data will be confirmed. • Additional soil samples, surface water, and sediments samples will be collected and analyzed at Analytical Level III to complete the nature and extent of contamination and determination of unacceptable risks. • CLP-like data packages for Ohio VAP investigation analytical data can be obtained from the project laboratory if it is needed to support the DQOs of the RCRA corrective action. • Vernay will perform the Facility Investigation and prepare and submit the RFI Report in two phases to enhance decision-making process, and optimize the overall RCRA corrective action. • An iterative ground water well installation program will be conducted during the RFI to ensure the optimum placement of monitoring wells, and to enhance the decision-making process. • An Environmental Indicator Report for ground water will be submitted that demonstrates that ground water contamination is stabilized. • An Environmental Indicator Report for human health will be submitted demonstrating that all current exposures are under control. • A Ground Water Technical Memorandum will be completed during Phase I of the RFI to present critical hydrogeologic data and to confirm that the RCRA corrective action ground water EI determination is proceeding as scheduled, and that existing interim measures are performing as intended. • Analysis using US EPA SW-846 standard methods, and practical quantitation limits (PQLs) that will permit the project objectives to be met. A table will be presented in the QAPP presenting project-specific PQLs. • Analysis of soil samples for geological properties will be analyzed at Analytical Level V. • Quarterly ground water monitoring will be conducted to reduce uncertainty in the evaluation of mobility and stabilization of COCs. • All sampling and analysis will be conduced following the project QAPP, US EPA guidance (US EPA, 1998), task-specific SOWs, and the Consent Order. • Any risk assessments will estimate human health and ecological risk under reasonable maximum exposure for both current and reasonably expected future land use scenarios. US EPA guidance will be followed (US EPA, 1989) in conducting risk assessments. • Screening values derived from Federal MCLs, US EPA Region IX PRGs, US EPA Region V ESLs, US EPA Regions V RBSLs, and RAGs will be used. • If an interim measure is implemented to meet the EIs, a report will be prepared summarizing the construction and implementation. • A Final Corrective Measures Proposal will be prepared that proposes the corrective measures necessary to protect human health and the environment from all current and future unacceptable risks.

TABLE 2: Project Data Quality Objectives

Step in the DQO Process	Systematic Planning Activities	Intended Purpose of Ohio EPA Investigation VAP Data Within the Planning Activities	Outputs to Support Planning Decisions
4. <u>Define the Boundaries of the RCRA Corrective Action</u> **Note:** An important deliverable for this step is a RCRA Facility Investigation Sampling List Technical Memorandum.	• Define the exposure area and exposure points, receptor population, exposure route, exposure medium for current and potential future receptors on and off of the Facility. • Determine a representative RFI sampling list of constituents. • Determine the area of ground water contamination on and off of the Facility. • Determine the area of soil contamination on the Facility. • Define a water well and substructure (e.g. basements, sumps, cisterns) survey area for the Human Health EI and to assess unacceptable risks. • Determine the area of surface water and sediment contamination in the unnamed creek. • Determine areas of ground water and soil contamination requiring remedial action. • Determine upgradient concentrations of COCs in ground water. • Determine background concentrations of COC metals in soil.	• Use Analytical Level III Ohio VAP investigation analytical data presented in the CCR to develop an initial conceptual site model for human health and the environment. • Use Analytical Level III Ohio VAP investigation soil analytical data to establish the area of soil contamination on the Facility, and present the results in the CCR. • Use Analytical Level III Ohio VAP investigation soil data to determine what additional soil analytical data is needed. • Use Analytical Level III Ohio VAP investigation soil and ground water data to assist in determining the chemical groups that do not need to be included as part of the RFI sampling list. • Use Analytical Level III Ohio VAP investigation analytical data to assist in determining the specific chemicals to be included for each chemical group on the RFI sampling list.	• Analytical Level III ground water, surface water, and sediment data will be used to refine the human health and environment conceptual site model as information is obtained during the RCRA corrective action. • Analytical Level III soil data will be collected to finalize the area of contamination, and to confirm Ohio VAP analytical results. • A water well and substructure survey will be conducted at properties within the well survey area. • A decision tree matrix will be developed to assist the US EPA and Vernay with issues regarding well or substructure abandonment to eliminate current unacceptable risks to human health. • The determination of the RFI sampling list will consist of a logical process that will include, at a minimum, the following: comparison of the availability of toxicity data between the US EPA Appendix IX list and the US EPA TCL/TAL list; the frequency of detections of Analytical Level III data collected during the Ohio VAP investigation; historical chemical usage at the Facility based on information presented in the CCR and the PA/VSI; interviews with Vernay chemists and engineers; and, US EPA data for releases associated with the rubber manufacturing industry (US EPA, 1995). • A Technical Memorandum will be prepared summarizing the development of the RFI sampling list and submitted to the US EPA for review. • An ecological risk screening process following US EPA guidance (US EPA, 1989) will be completed to refine the initial conceptual site model, and define data needs for surface water and sediment sampling. • A risk assessment will be completed following US EPA guidance (US EPA, 1989) to define the unacceptable risks to human health and the environment and cleanup values for on and off of the Facility. • An evaluation of corrective measures that will remediate areas of soil and ground water contamination will be completed. • Samples from upgradient ground water monitoring wells will be collected and analyzed at Analytical Level III to determine concentrations of any COCs migrating on to the facility. • Background soil samples from an unaffected area off of the Facility will be collected and analyzed for COC metals at Analytical Level III.

TABLE 2: Project Data Quality Objectives

Step in the DQO Process	Systematic Planning Activities	Intended Purpose of Ohio EPA VAP Investigation Data Within the Planning Activities	Outputs to Support Planning Decisions
5. **Develop Decision Rules, Specify Tolerable Limits on Decision Errors, and Optimize Design for Obtaining Data**	• Specify the population parameter (e.g. median, median, total amount, etc.) that is important to make decisions about data needs and to determine unacceptable risks to human health and the environment. • Determine any sources of error during field sample collection, field instrument screening, contaminant fate and transport modeling, and the laboratory analysis of samples. • Specify routine procedures used to assess data precision, accuracy, and completeness during laboratory analysis of samples. • Develop a corrective action system that corrects field, modeling, and analytical errors. • Develop and design data collection objectives and procedures.		• Compare PQLs used during the Ohio VAP project PQLs used of the RCRA corrective action to determine if there is any significant variability. • Compare ground water, surface water, sediment, and soil analytical data collected during the Ohio VAP investigation with data collected during the RCRA corrective action to determine if there is any significant variability. • Prepare a RCRA Corrective Action Quality Assurance Plan following US EPA guidance (US EPA, 1998) that defines the organization, objectives, QA/QC activities, decision errors, and corrective steps with the RCRA corrective action process. • Prepare task-specific statement of works during the RCRA corrective action that defines objectives, sampling procedures, and QA/QC requirements. • Calibrate field instruments prior to any use following standard operating procedures. • Complete an independent validation of analytical reports and data following procedures outlined in the QAPP. • Prepare a baseline risk assessment following US EPA guidance (US EPA, 1989) to evaluate the uncertainty of the exposure assessment. • Use US EPA accepted modeling software when completing contaminant fate and transport modeling for the risk assessment or evaluation of corrective measures. Use Analytical Level III data to develop models.

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Vernay Laboratories, Inc.

Plant 2/3 Facility

Project No. 0292.11.25

TABLE 3: Comparison of Data Quality Objective Analytical Levels and Intended Data Use of the Ohio VAP Investigation Data During the RCRA Corrective Action

Matrix	Analysis	DQO Analytical Level		Intended Data Use of the Ohio VAP Investigation Data During the RCRA Corrective Action						
		Ohio VAP	RCRA CA	Nature and Extent of Contamination[B]	Vadose Zone Modeling	Contaminant Fate and Transport Modeling	Risk Assessment[C]	Evaluation of Corrective Measures	Field Screening	Evaluation of Interim Measures/ Pilot Studies
Soil	VOCs	Level III	Level III[A]	X	X		X	X		X
	SVOCs	Level III	Level III[A]	X	X		X	X		
	PAHs	Level III	NA	X	X		X	X		
	Pesticides	Level III	NA	X	X		X	X		
	Herbicides	Level III	NA	X	X		X	X		
	Total Petroleum Hydrocarbon	Level III	NA	X	X		X	X		
	PCBs	Level III	NA	X	X		X	X		
	Metals	Level III	Level III[A]	X	X		X	X		
	Total Organic Carbon	Level III	Level III[A]		X	X	X	X		X
	Field Headspace Organics	Level II	Level II						X	X
	Geological Properties	Level V	Level V		X	X	X	X		X
Ground Water	VOCs	Level III	Level III[A]	X		X	X	X		X
	SVOCs	Level III	Level III[A]	X		X	X	X		
	PAHs	Level III	Level III[A]	X		X	X	X		
	Pesticides	Level III	Level III[A]	X		X	X	X		
	Herbicides	Level III	Level III[A]	X		X	X	X		
	PCBs	Level III	Level III[A]	X		X	X	X		
	Metals	Level III	Level III[A]	X		X	X	X		
	Total Hardness	Level III	Level III[A]					X		X
	pH-laboratory	Level III	Level III[A]			X		X		X
	pH-field	Level II	Level I			X		X	X	X
	Total Dissolved Solids	Level III	Level III[A]			X		X		X
	Chloride	Level III	Level III[A]			X		X		X
	Sulfate	Level III	Level III[A]			X		X		X
	Nitrate as N	Level III	Level III[A]			X		X		X
	Phosphate as P, Ortho	Level III	Level III[A]			X		X		X
	Nitrite as N	Level III	Level III[A]			X		X		X
	Alkalinity, Total	Level III	Level III[A]			X		X		X
	Methane	Level III	Level III[A]			X		X		X

TABLE 3: Comparison of Data Quality Objective Analytical Levels and Intended Data Use of the Ohio VAP Investigation Data During the RCRA Corrective Action

Matrix	Analysis	DQO Analytical Level		Intended Data Use of the Ohio VAP Investigation Data During the RCRA Corrective Action						
		Ohio VAP	RCRA CA	Nature and Extent of Contamination[B]	Vadose Zone Modeling	Contaminant Fate and Transport Modeling	Risk Assessment[C]	Evaluation of Corrective Measures	Field Screening	Evaluation of Interim Measures/ Pilot Studies
Ground Water	Ethane	Level III	Level III[A]			X		X		X
	Ethene	Level III	Level III[A]			X		X		X
	specific conductance-field	Level I	Level I						X	
	temperature-field	Level I	Level I						X	
	water level	Level I	Level I						X	
	turbidity	Level I	Level I						X	
	dissolved oxygen-field	Level I	Level I						X	
	oxygen reduction potential-field	Level I	Level I						X	
	salinity-field	Level I	NA						X	
Ground Water Geoprobe Samples	VOCs	Level III	Level III[A]	X		X	X	X		X
Surface Water	VOCs	Level III	Level III[A]	X		X	X	X		
Sediment	VOCs	Level III	Level III[A]	X		X	X	X		
	Total Organic Carbon	Level III	Level III[A]			X		X		
Air	VOCs	Level III	Level III[A]	X			X	X		

A = The difference between the Ohio VAP and RCRA CA Analytical Level III data is that a CLP-like data package is being obtained during the RCRA CA.
B = For ground water, surface water, and sediment, this category includes: assisting in developing scope or work and conceptual site model; evaluation of trends in concentration sof VOCs over time; contaminant fate and transport evaluation; and ground water indicator report.
C = Includes: determination of chemicals of concern; potential human health exposure models; risk screening evaluations; contaminant fate and transport evaluation; baseline risk assessment; and human health indicator report.
NA = Not analyzed during the RCRA corrective action.

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Vernay Laboratories, Inc.

Plant 2/3 Facility

Project No. 0292.11.25

TABLE 4: Comparison of Practical Quantitation Limits

Volatile Organic Compounds-SW846 8260B Water			
Compound	**Units**	**RCRA CA PQL**	**Ohio VAP PQL**
Acetone	ug/L	10	10
Benzene	ug/L	1	1
Bromodichloromethane	ug/L	1	1
Bromoform	ug/L	1	1
Bromomethane	ug/L	1	2
2-Butanone	ug/L	10	10
Carbon disulfide	ug/L	1	1
Carbon tetrachloride	ug/L	1	1
Chlorobenzene	ug/L	1	1
Dibromochloromethane	ug/L	1	1
Chloroethane	ug/L	1	2
Chloroform	ug/L	1	1
Chloromethane	ug/L	1	2
Cyclohexane	ug/L	1	NA
1,2-Dibromo-3-chloropropane	ug/L	2	NA
1,2-Dibromoethane	ug/L	1	NA
1,2-Dichlorobenzene	ug/L	1	10
1,3-Dichlorobenzene	ug/L	1	10
1,4-Dichlorobenzene	ug/L	1	10
Dichlorodifluoromethane	ug/L	1	NA
1,1-Dichloroethane	ug/L	1	1
1,2-Dichloroethane	ug/L	1	1
cis-1,2-Dichloroethene	ug/L	0.5	0.5
trans-1,2-Dichloroethene	ug/L	0.5	0.5
1,1-Dichloroethene	ug/L	1	1
1,2-Dichloropropane	ug/L	1	1
cis-1,3-Dichloropropene	ug/L	1	1
trans-1,3-Dichloropropene	ug/L	1	1
Ethylbenzene	ug/L	1	1
2-Hexanone	ug/L	10	10
Isopropylbenzene	ug/L	1	NA
Methyl acetate	ug/L	10	NA
Methylcyclohexane	ug/L	1	NA
Methylene chloride	ug/L	1	1
4-Methyl-2-pentanone	ug/L	10	5
Methyl tert-butyl ether	ug/L	5	NA
n-Hexane	ug/L	NA	1
Styrene	ug/L	1	1
1,1,2,2-Tetrachloroethane	ug/L	1	1
Tetrachloroethene	ug/L	1	1
Toluene	ug/L	1	1
1,2,4-Trichlorobenzene	ug/L	1	10
1,1,1-Trichloroethane	ug/L	1	1
1,1,2-Trichloroethane	ug/L	1	1
Trichloroethene	ug/L	1	1
Trichlorofluoromethane	ug/L	1	NA
1,1,2-Trichloro-1,2,2-trifluoroethane	ug/L	1	NA
Vinyl chloride	ug/L	1	2
Xylenes (total)	ug/L	1	1

NA = Not Analyzed
ND = Not Determined

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TABLE 4: Comparison of Practical Quantitation Limits

Volatile Organic Compounds-SW846 8260B Solid			
Compound	Units	RCRA CA PQL	Ohio VAP PQL
Acetone	ug/kg	20	20
Benzene	ug/kg	5	5
Bromodichloromethane	ug/kg	5	5
Bromoform	ug/kg	5	5
Bromomethane	ug/kg	5	10
2-Butanone	ug/kg	20	20
Carbon disulfide	ug/kg	5	5
Carbon tetrachloride	ug/kg	5	5
Chlorobenzene	ug/kg	5	5
Dibromochloromethane	ug/kg	5	5
Chloroethane	ug/kg	5	10
Chloroform	ug/kg	5	5
Chloromethane	ug/kg	5	10
Cyclohexane	ug/kg	10	NA
1,2-Dibromo-3-chloropropane	ug/kg	10	NA
1,2-Dibromoethane	ug/kg	5	NA
1,2-Dichlorobenzene	ug/kg	5	10
1,3-Dichlorobenzene	ug/kg	5	10
1,4-Dichlorobenzene	ug/kg	5	10
Dichlorodifluoromethane	ug/kg	5	NA
1,1-Dichloroethane	ug/kg	5	5
1,2-Dichloroethane	ug/kg	5	5
cis-1,2-Dichloroethene	ug/kg	2.5	2.5
trans-1,2-Dichloroethene	ug/kg	2.5	2.5
1,1-Dichloroethene	ug/kg	5	5
1,2-Dichloropropane	ug/kg	5	5
cis-1,3-Dichloropropene	ug/kg	5	5
trans-1,3-Dichloropropene	ug/kg	5	5
Ethylbenzene	ug/kg	5	5
2-Hexanone	ug/kg	20	20
Isopropylbenzene	ug/kg	5	NA
Methyl acetate	ug/kg	10	NA
Methylcyclohexane	ug/kg	10	NA
Methylene chloride	ug/kg	5	5
4-Methyl-2-pentanone	ug/kg	20	20
Methyl tert-butyl ether	ug/kg	20	NA
n-Hexane	ug/kg	NA	5
Hexachlorobutadiene	ug/kg	NA	10
Naphthalene	ug/kg	NA	10
Styrene	ug/kg	5	5
1,1,2,2-Tetrachloroethane	ug/kg	5	5
Tetrachloroethene	ug/kg	5	5
Toluene	ug/kg	5	5
1,2,4-Trichlorobenzene	ug/kg	5	10
1,1,1-Trichloroethane	ug/kg	5	5
1,1,2-Trichloroethane	ug/kg	5	5
Trichloroethene	ug/kg	5	5
Trichlorofluoromethane	ug/kg	5	NA
1,1,2-Trichloro-1,2,2-trifluoroethane	ug/kg	5	NA
Vinyl chloride	ug/kg	5	10
Xylenes (total)	ug/kg	5	5

NA = Not Analyzed
ND = Not Determined

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TABLE 4: Comparison of Practical Quantitation Limits

Volatile Organic Compounds-TO14 Air			
Compound	**Units**	**RCRA CA PQL**	**Ohio VAP PQL**
Acetone	ppb(v/v)	5	NA
Acetonitrile	ppb(v/v)	1	NA
Acrolein	ppb(v/v)	0.5	NA
Acrylonitrile	ppb(v/v)	0.5	NA
alpha-Methylstyrene	ppb(v/v)	0.2	NA
Benzene	ppb(v/v)	0.2	0.48
Benzyl chloride	ppb(v/v)	0.2	0.48
Bromodichloromethane	ppb(v/v)	0.2	NA
Bromoform	ppb(v/v)	0.2	NA
Bromomethane	ppb(v/v)	0.2	0.48
1,3-Butadiene	ppb(v/v)	0.2	NA
n-Butane	ppb(v/v)	0.2	NA
1-Butanol	ppb(v/v)	0.5	NA
2-Butanone (MEK)	ppb(v/v)	0.5	NA
Carbon disulfide	ppb(v/v)	0.2	NA
Carbon tetrachloride	ppb(v/v)	0.2	0.48
Chlorobenzene	ppb(v/v)	0.2	0.48
Dibromochloromethane	ppb(v/v)	0.2	NA
Chlorodifluoromethane	ppb(v/v)	0.2	NA
Chloroethane	ppb(v/v)	0.2	0.48
Chloroform	ppb(v/v)	0.2	0.48
Chloromethane	ppb(v/v)	0.5	1.2
3-Chloropropene	ppb(v/v)	0.2	NA
Cyclohexane	ppb(v/v)	0.5	NA
n-Decane	ppb(v/v)	0.2	NA
1,2-Dibromoethane (EDB)	ppb(v/v)	0.2	0.48
Dibromomethane	ppb(v/v)	0.2	NA
1,2-Dichlorobenzene	ppb(v/v)	0.2	0.48
1,3-Dichlorobenzene	ppb(v/v)	0.2	0.48
1,4-Dichlorobenzene	ppb(v/v)	0.2	0.48
Dichlorodifluoromethane	ppb(v/v)	0.2	0.48
1,1-Dichloroethane	ppb(v/v)	0.2	0.48
1,2-Dichloroethane	ppb(v/v)	0.2	0.48
cis-1,2-Dichloroethene	ppb(v/v)	0.2	0.48
trans-1,2-Dichloroethene	ppb(v/v)	0.2	NA
1,1-Dichloroethene	ppb(v/v)	0.2	0.48
1,2-Dichloropropane	ppb(v/v)	0.2	0.48
cis-1,3-Dichloropropene	ppb(v/v)	0.2	0.48
trans-1,3-Dichloropropene	ppb(v/v)	0.2	0.48
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ppb(v/v)	0.2	0.48
n-Dodecane	ppb(v/v)	0.2	NA
Ethylbenzene	ppb(v/v)	0.2	0.48
Ethyl ether	ppb(v/v)	0.5	NA
4-Ethyltoluene	ppb(v/v)	0.2	NA
n-Heptane	ppb(v/v)	0.2	NA
Hexachlorobutadiene	ppb(v/v)	0.2	0.48
n-Hexane	ppb(v/v)	0.2	NA
2-Hexanone	ppb(v/v)	0.5	NA
Cumene	ppb(v/v)	0.2	NA
Methanol	ppb(v/v)	10	NA
Methylene chloride	ppb(v/v)	0.5	0.48
4-Methyl-2-pentanone (MIBK)	ppb(v/v)	0.5	NA
Methyl tert-butyl ether	ppb(v/v)	0.5	NA
Naphthalene	ppb(v/v)	0.2	NA
Nonane	ppb(v/v)	0.2	NA
n-Octane	ppb(v/v)	0.2	NA
Pentane	ppb(v/v)	0.5	NA
n-Propylbenzene	ppb(v/v)	0.2	NA
Styrene	ppb(v/v)	0.2	0.48
1,1,2,2-Tetrachloroethane	ppb(v/v)	0.2	0.48
Tetrachloroethene	ppb(v/v)	0.2	0.48
Toluene	ppb(v/v)	0.2	0.48
1,2,4-Trichlorobenzene	ppb(v/v)	0.2	NA
1,1,1-Trichloroethane	ppb(v/v)	0.2	0.48
1,1,2-Trichloroethane	ppb(v/v)	0.2	0.48
Trichloroethene	ppb(v/v)	0.2	0.48
Trichlorofluoromethane	ppb(v/v)	0.2	0.48
1,2,3-Trichloropropane	ppb(v/v)	0.2	NA
1,1,2-Trichlorotrifluoroethane	ppb(v/v)	0.2	NA
1,1,2-Trichloro-1,2,2-trifluoroethane	ppb(v/v)	0.2	0.48
1,2,4-Trimethylbenzene	ppb(v/v)	0.2	0.48
1,3,5-Trimethylbenzene	ppb(v/v)	0.2	0.48
n-Undecane	ppb(v/v)	0.2	NA
Vinyl acetate	ppb(v/v)	0.5	NA
Vinyl chloride	ppb(v/v)	0.2	0.48
m-Xylene & p-Xylene	ppb(v/v)	0.2	0.48
o-Xylene	ppb(v/v)	0.2	0.48

NA = Not Analyzed
ND = Not Determined

The Payne Firm, Inc.

TABLE 4: Comparison of Practical Quantitation Limits

Semi-Volatile Organic Compounds-SW846 8270C Water			
Compound	Units	RCRA CA PQL	Ohio VAP PQL
Acenaphthene	ug/L	10	10
Acenaphthylene	ug/L	10	10
Acetophenone	ug/L	10	NA
Anthracene	ug/L	10	10
Atrazine	ug/L	10	NA
Benzaldehyde	ug/L	10	NA
Benzo(a)anthracene	ug/L	10	10
Benzo(b)fluoranthene	ug/L	10	10
Benzo(k)fluoranthene	ug/L	10	10
Benzo(ghi)perylene	ug/L	10	10
Benzo(a)pyrene	ug/L	10	10
1,1'-Biphenyl	ug/L	10	NA
bis(2-Chloroethoxy)methane	ug/L	10	10
bis(2-Chloroethyl) ether	ug/L	10	10
bis(2-Ethylhexyl) phthalate	ug/L	10	10
4-Bromophenyl phenyl ether	ug/L	10	10
Butyl benzyl phthalate	ug/L	10	10
Caprolactam	ug/L	10	NA
Carbazole	ug/L	10	10
4-Chloroaniline	ug/L	10	10
4-Chloro-3-methylphenol	ug/L	10	10
2-Chloronaphthalene	ug/L	10	10
2-Chlorophenol	ug/L	10	10
4-Chlorophenyl phenyl ether	ug/L	10	10
Chrysene	ug/L	10	10
Dibenz(a,h)anthracene	ug/L	10	10
Dibenzofuran	ug/L	10	10
Di-n-butyl phthalate	ug/L	10	10
3,3'-Dichlorobenzidine	ug/L	50	50
2,4-Dichlorophenol	ug/L	10	10
Diethyl phthalate	ug/L	10	10
2,4-Dimethylphenol	ug/L	10	10
Dimethyl phthalate	ug/L	10	10
4,6-Dinitro-2-methylphenol	ug/L	50	50
2,4-Dinitrophenol	ug/L	50	50
2,4-Dinitrotoluene	ug/L	10	10
2,6-Dinitrotoluene	ug/L	10	10
Di-n-octyl phthalate	ug/L	10	10
Fluoranthene	ug/L	10	10
Fluorene	ug/L	10	10
Hexachlorobenzene	ug/L	10	10
Hexachlorobutadiene	ug/L	10	10
Hexachlorocyclopentadiene	ug/L	50	50
Hexachloroethane	ug/L	10	10
Indeno(1,2,3-cd)pyrene	ug/L	10	10
Isophorone	ug/L	10	10
2-Methylnaphthalene	ug/L	10	10
2-Methylphenol	ug/L	10	10
4-Methylphenol	ug/L	10	10
Naphthalene	ug/L	10	10
2-Nitroaniline	ug/L	50	50
3-Nitroaniline	ug/L	50	50
4-Nitroaniline	ug/L	50	50
Nitrobenzene	ug/L	10	10

Semi-Volatile Organic Compounds-SW846 8270C Water			
Compound	Units	RCRA CA PQL	Ohio VAP PQL
2-Nitrophenol	ug/L	10	10
4-Nitrophenol	ug/L	50	50
N-Nitrosodiphenylamine	ug/L	10	10
N-Nitrosodi-n-propylamine	ug/L	10	10
2,2'-oxybis(1-Chloropropane)	ug/L	10	10
Pentachlorophenol	ug/L	10	10
Phenanthrene	ug/L	10	10
Phenol	ug/L	10	10
Pyrene	ug/L	10	10
2,4,5-Trichlorophenol	ug/L	10	10
2,4,6-Trichlorophenol	ug/L	10	10

NA = Not Analyzed
ND = Not Determined

The Payne Firm, Inc.

TABLE 4: Comparison of Practical Quantitation Limits

Semi-Volatile Organic Compounds-SW846 8270C Solid			
Compound	**Units**	**RCRA CA PQL**	**Ohio VAP PQL**
Acenaphthene	ug/kg	330	330
Acenaphthylene	ug/kg	330	330
Acetophenone	ug/kg	330	NA
Anthracene	ug/kg	330	330
Atrazine	ug/kg	330	NA
Benzaldehyde	ug/kg	330	NA
Benzo(a)anthracene	ug/kg	330	330
Benzo(b)fluoranthene	ug/kg	330	330
Benzo(k)fluoranthene	ug/kg	330	330
Benzo(ghi)perylene	ug/kg	330	330
Benzo(a)pyrene	ug/kg	330	330
1,1'-Biphenyl	ug/kg	330	NA
bis(2-Chloroethoxy)methane	ug/kg	330	330
bis(2-Chloroethyl) ether	ug/kg	330	330
bis(2-Ethylhexyl) phthalate	ug/kg	330	330
4-Bromophenyl phenyl ether	ug/kg	330	330
Butyl benzyl phthalate	ug/kg	330	330
Caprolactam	ug/kg	330	NA
Carbazole	ug/kg	330	330
4-Chloroaniline	ug/kg	330	330
4-Chloro-3-methylphenol	ug/kg	330	330
2-Chloronaphthalene	ug/kg	330	330
2-Chlorophenol	ug/kg	330	330
4-Chlorophenyl phenyl ether	ug/kg	330	330
Chrysene	ug/kg	330	330
Dibenz(a,h)anthracene	ug/kg	330	330
Dibenzofuran	ug/kg	330	330
Di-n-butyl phthalate	ug/kg	330	330
3,3'-Dichlorobenzidine	ug/kg	1600	1600
2,4-Dichlorophenol	ug/kg	330	330
Diethyl phthalate	ug/kg	330	330
2,4-Dimethylphenol	ug/kg	330	330
Dimethyl phthalate	ug/kg	330	330
4,6-Dinitro-2-methylphenol	ug/kg	1600	1600
2,4-Dinitrophenol	ug/kg	1600	1600
2,4-Dinitrotoluene	ug/kg	330	330
2,6-Dinitrotoluene	ug/kg	330	330
Di-n-octyl phthalate	ug/kg	330	330
Fluoranthene	ug/kg	330	330
Fluorene	ug/kg	330	330
Hexachlorobenzene	ug/kg	330	330
Hexachlorobutadiene	ug/kg	330	330
Hexachlorocyclopentadiene	ug/kg	1600	1600
Hexachloroethane	ug/kg	330	330
Indeno(1,2,3-cd)pyrene	ug/kg	330	330
Isophorone	ug/kg	330	330
2-Methylnaphthalene	ug/kg	330	330
2-Methylphenol	ug/kg	330	330
4-Methylphenol	ug/kg	330	330
Naphthalene	ug/kg	330	330
2-Nitroaniline	ug/kg	1600	1600
3-Nitroaniline	ug/kg	1600	1600
4-Nitroaniline	ug/kg	1600	1600

Semi-Volatile Organic Compounds-SW846 8270C Solid			
Compound	**Units**	**RCRA CA PQL**	**Ohio VAP PQL**
Nitrobenzene	ug/kg	330	330
2-Nitrophenol	ug/kg	330	330
4-Nitrophenol	ug/kg	1600	1600
N-Nitrosodiphenylamine	ug/kg	330	330
N-Nitrosodi-n-propylamine	ug/kg	330	330
2,2'-oxybis(1-Chloropropane)	ug/kg	330	330
Pentachlorophenol	ug/kg	330	330
Phenanthrene	ug/kg	330	330
Phenol	ug/kg	330	330
Pyrene	ug/kg	330	330
2,4,5-Trichlorophenol	ug/kg	330	330
2,4,6-Trichlorophenol	ug/kg	330	330

NA = Not Analyzed
ND = Not Determined

The Payne Firm, Inc.

TABLE 4: Comparison of Practical Quantitation Limits

Metals-SW846 6010B Water			
Compound	**Units**	**RCRA CA PQL**	**Ohio VAP PQL**
Chromium	mg/L	0.005	0.01
Copper	mg/L	0.025	NA
Zinc	mg/L	0.02	NA

Metals-SW846 6010B Solid			
Compound	**Units**	**RCRA CA PQL**	**Ohio VAP PQL**
Chromium	mg/kg	0.5	1
Copper	mg/kg	2.5	NA
Zinc	mg/kg	2	NA

NA = Not Analyzed
ND = Not Determined

The Payne Firm, Inc.

Vernay Laboratories, Inc.

Plant 2/3 Facility

Project No. 0292.11.25

TABLE 5: Comparison of Analytical Methods

Parameter	Water		Solid		Air	
	Ohio VAP	RCRA CA	Ohio VAP	RCRA CA	Ohio VAP	RCRA CA
VOCs	SW846-8260	SW846-8260	SW846-8260	SW846-8260	TO-14	TO-14
SVOCs	SW846-8270	SW846-8270	SW846-8270	SW846-8270	NA	NA
Metals	SW846-6010/7470	SW846-6010	SW846-6010/7470	SW846-6010	NA	NA
PAHs	CFR136A-610; SW846-8310	NA	SW846-8270/8310	NA	NA	NA
Pesticides	SW46-8081	NA	SW46-8081	NA	NA	NA
Herbicides	SW846-8151	NA	SW846-8151	NA	NA	NA
TPH	NA	NA	MCAWW-418.1	NA	NA	NA
PCBs	SW846-8082	NA	SW846-8082	NA	NA	NA
TOC	MCAWW-415.1	MCAWW-415.1	MSA Walkley-Black; SW846-9060	SW846-9060	NA	NA
Total Hardness	MCAWW-130.2	MCAWW-130.2	NA	NA	NA	NA
pH	MCAWW-150.1	MCAWW-150.1	NA	NA	NA	NA
TDS	MCAWW-160.1	MCAWW-160.1	NA	NA	NA	NA
Chloride	MCAWW-300.0	MCAWW-300.0	NA	NA	NA	NA
Sulfate	MCAWW-300.0	MCAWW-300.0	NA	NA	NA	NA
Sulfide	MCAWW-376.1	MCAWW-376.1	NA	NA	NA	NA
Nitrate as N	MCAWW-300.0	MCAWW-300.0	NA	NA	NA	NA
Phosphate as P, Ortho	MCAWW-300.0	MCAWW-300.0	NA	NA	NA	NA
Nitrite	MCAWW-300.0	MCAWW-300.0	NA	NA	NA	NA
Alkalinity, Total	MCAWW-310.1	MCAWW-310.1	NA	NA	NA	NA
Methane	RSK SOP-175	RSK SOP-175	NA	NA	NA	NA
Ethane	RSK SOP-175	RSK SOP-175	NA	NA	NA	NA
Ethene	RSK SOP-175	RSK SOP-175	NA	NA	NA	NA
Grain Size	NA	NA	ASTM D422	ASTM D422	NA	NA
Unit Weight	NA	NA	ACOE	ACOE	NA	NA
Moisture Content	NA	NA	ASTM D2216	ASTM D2216	NA	NA
Specific Gravity	NA	NA	ASTM D854	ASTM D854	NA	NA
Atterberg Limits	NA	NA	ASTM D4318	ASTM D4318	NA	NA
Permeability	NA	NA	ASTM D5084	ASTM D5084	NA	NA
Soil Classification	NA	NA	ASTM D2487	ASTM D2487	NA	NA
Slake Durability	NA	NA	ASTM D4644	ASTM D4644	NA	NA

CFR136A	"Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater", 40CFR, Part 136, Appendix A, October 26, 1984 and subsequent revisions
SW846	"Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 and its updates.
MCAWW	"Methods for Chemical Analysis of Water and Wastes", EPA-600/4-79-020, March 1983 and subsequent revisions.
RSK	Sample Prep and Calculations for Dissolved Gas Analysis in Water Samples Using a GC Headspace Equilibrations Technique, RSKSOP-175, REV. 0, 8/11/94, USEPA Research Lab
ASTM	American Society for Testing Materials
TO-14	"Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air," EPA-600/4-79-041, April 1984.
ACOE	"Laboratory Soil Testing," Army Corps of Engineers, EM 1110-2-1906, November 30, 1970.
MSA	"Methods of Soil Analysis, Chemical and Microbiological Properties", Part 2, 2nd Ed., 1982 and subsequent revisions.
NA	Not Analyzed

APPENDIX I

OHIO VAP RULES: OHIO ADMINISTRATIVE CODE 3745-300-07

(e) Compliance with rule 3745-300-10 of the Administrative Code.

(E) Sampling procedures.

(1) The volunteer must establish and employ sampling procedures which satisfy the following:

(a) The volunteer must establish and employ data quality objectives which are consistent with U.S. EPA interim final guidance, "Data Quality Objectives Process for Superfund" (September 1993) according to its limitations and intended uses, and the data quality objectives must, at a minimum:

(i) Be consistent with the sampling objectives;

(ii) Define the most appropriate types and locations of samples to collect;

(iii) Determine the most appropriate conditions from which to collect the samples; and

(iv) Define the quality and quantity of samples to be collected and must specify tolerable limits on decision errors which will be used as the basis for establishing the quantity and quality of data needed to support the decision.

(b) The volunteer must identify the samples and analytes for which the certified laboratory must analyze and the volunteer must ensure that:

(i) The sampling procedures employed at the property are consistent with the sample quality requirements of the certified laboratory; and

(ii) The certified laboratory is certified for and capable of performing the analyses that are required for the property, including those necessary for forming the basis of the no further action letter.

[Comment: The volunteer needs to contact the certified laboratory that is conducting analyses in support of the voluntary action to determine if the applicable standards for the property are within the laboratory's reporting limits. Properties with multiple chemicals of concern must perform a cumulative adjustment following the procedures contained in paragraph (D) of rule 3745-300-08 of the Administrative Code. The cleanup levels calculated by performing this cumulative adjustment may result in chemical concentrations that are below the certified laboratory's reporting limits. The volunteer is responsible for determining that the certified laboratory which performs analyses in support of the no further action letter, is capable of detecting the chemicals of concern on the property at or below the applicable standards.]

(c) The volunteer must establish and employ acceptable quality assurance and quality control (QA/QC) procedures when collecting field data during the "Phase II Property Assessment". The field QA/QC procedures must serve to minimize sources of error, minimize the potential for cross contamination, and maximize the representativeness of the data collected, and must, at a minimum, include the following:

(i) A review of the laboratory's quality assurance program plan and standard operating procedures for consistency with field QA/QC procedures;

(ii) Developed field QA/QC procedures, at a minimum, for such items as:

(*a*) Equipment decontamination;

(*b*) Trip blanks, equipment blanks, field blanks, and duplicates;

(*c*) Calibration of field instruments, which includes procedures for instrument correction and re-calibration when necessary;

(*d*) Documentation and record maintenance;

(*e*) Sample handling, preservation and holding times; and

(*f*) Chain-of-custody.

(d) The volunteer must establish and employ data collection, field testing, field screening and sampling techniques. Data collection, field testing, field screening and sampling techniques must be used in a manner that is consistent with achieving the purpose of the "Phase II Property Assessment". The volunteer must use the data collection, field testing, field screening and sampling techniques, according to their limitations and intended uses, contained in the following documents:

(i) Documents containing data collection, field testing, field screening and sampling techniques which are demonstrated to:

(*a*) Be field-validated;

(*b*) Be documented and peer-reviewed;

(*c*) Ensure the representativeness of samples taken following the technique; and (*d*) Be proven capable of achieving the data quality needs; or

(ii) "Subsurface Characterization and Monitoring Techniques, A Desk Reference Guide. Volume 1: Solids and Ground Water Appendices A and B; Volume II: The Vadose Zone, Field Screening and Analytical Methods Appendices C and D." U.S. EPA, office of research and development, Washington D.C. 20460 (May 1993).

[Comment: The following guidance may be helpful in selecting data collection techniques:

"Guidance For Data Usability In Risk Assessment", U.S. EPA, office of solid waste and emergency response directive 9285. 7-05, EPA/540/G-90/008, October 1990, interim final;

"Guidelines and Specifications For Preparing Quality Assurance Project Plans", Ohio EPA, division of emergency and remedial response, policy no. DERR-00-RR-008, March 1990; and

"Quality Assurance/ Quality Control Guidance For Removal Activities: Sampling QA/QC Plan and Data Validation Procedures", interim final, EPA/540/G-90/004, April 1989.]

(e) If it is necessary to take a ground water sample directly beneath a source area, the volunteer must use methods that will not cause any chemicals of concern to be drawn into the ground water due to the monitoring well.

(2) Sediment. The volunteer must assess sediment in accordance with the requirements contained in paragraph (F) of rule 3745-300-09 of the Administrative Code.

(3) Ground water. The volunteer must follow the methods and procedures according to their limitations and intended uses, contained in the following documents:

(a) Documents containing data collection, field testing and sampling techniques which are demonstrated to:

(i) Be field-validated;

(ii) Be documented and peer-reviewed;

(iii) Ensure the representativeness of samples taken following the technique; and

(iv) Be proven capable of achieving the data quality needs identified in paragraph (E) of this rule; or

(b) "Technical Guidance Manual For Hydrogeologic Investigations and Ground Water Monitoring," (Ohio EPA February 1995), except when the application of the "Technical Guidance Manual For Hydrogeologic Investigations and Ground Water Monitoring" document would be inconsistent with the purpose of the "Phase II Property Assessment" and this chapter.

(4) Surface water. When identified areas include or affect surface water, surface water samples must be collected and analyzed in accordance with:

(a) Ohio EPA, "Biological Criteria For the Protection of Aquatic Life: Volume II: Users Manual For Biological Field Assessment Of Ohio Surface Waters", October 30, 1987, updated January 1, 1988, amended September 30, 1989; and

(b) Section 3.3 of the "Manual of Ohio EPA Surveillance Methods And Quality Assurance Practices", October 1, 1988, revised December, 1991.

(F) Use of modeling.

(1) The volunteer must identify all models relied upon as part of the "Phase II Property Assessment" activities to determine a property's compliance with applicable standards or used to evaluate remedial activities conducted in accordance with rule 3745-300-15 of the Administrative Code. The modeling must be conducted in accordance with this rule.

(2) The model(s) must be:

(a) Generally accepted within the scientific community and peer reviewed, or:

(i) Code-verified. To be code-verified, the model must be shown to produce reliable and mathematically accurate results for all functions of the model; and

(ii) Scientifically valid for the processes being modeled.

(b) Used with assumptions and limitations reasonably consistent with conditions throughout the modeled area. The assumptions and limitations of the computer code, mathematical solution, technology utilized and computer code structure must be consistent with the conditions throughout the modeled area and the application of the model;

(c) Used in a manner consistent with the model's documentation and intended use; and

APPENDIX II

OHIO VAP QUALITY ASSURANCE POJECT PLAN

QUALITY ASSURANCE PROJECT PLAN
VOLUNTARY ACTION PROGRAM
PHASE II PROPERTY ASSESSMENT

VERNARY LABORATORIES, INC.
Plant 2/3 Property
875 Dayton Street
Yellow Springs, Ohio

Project No. 0109.59.12

Prepared By

THE PAYNE FIRM, INC.
Cincinnati, Ohio

TABLE OF CONTENTS

1.0 INTRODUCTION

This Quality Assurance Project Plan (QAPP) presents the objectives, functional activities and specific quality assurance (QA) and quality control (QC) activities associated with the Phase II activities conducted at the Vernay Laboratories, Inc. Plant 2/3 property (property) located at 875 Dayton Street in Yellow Springs, Ohio. The Phase II activities conducted at the property are consistent with the requirements of Ohio Environmental Protection Agency's Voluntary Action Program (VAP) Phase II Property Assessment (Ohio Administrative Code 3745-300-07). Three primary issues are addressed within the QAPP: 1) review of field QA/QC to ensure that samples were properly collected, packaged and shipped; 2) review of laboratory QA/QC to ensure that laboratory protocols were attained; and, 3) review of data to ensure that it is representative of the areas of interest and is sufficient to meet the purpose of the VAP Phase II Property Assessment.

2.0 FIELD QA/QC

The purpose of the field QA/QC is to minimize sources of error, minimize the potential for cross contamination, and maximize the representatives of the data collected during Phase II activities. The field QA/QC procedures identified below will be followed during implementation of field activities for the collection, packaging and shipment of samples.

2.1 Data Collection Procedures

Phase II data collection will be implemented using Payne Firm Standard Operating Procedures (SOPs) unless otherwise specified. Field sampling activities that do not have Payne Firm SOPs will be fully described in the Phase II Property Assessment Report.

Field QA/QC samples (e.g., field blanks, trip blanks, equipment blanks, and duplicate samples) will be collected and analyzed as identified by the data needs for the project. Specific field QA/QC samples will be identified in the Statement of Work and any associated addenda developed during the completion of the VAP. The general level of the QA/QC effort will be one set of QA/QC samples per 20 or fewer investigative samples.

2.2 Equipment Decontamination

Sampling equipment that is in direct contact with environmental media will be properly decontaminated. Such sampling equipment may include split-spoon samplers, reusable bailers, and ground water sampling pumps. The necessary decontamination procedures, equipment, and solutions are documented in the Payne Firm's SOPs (SOP 5-1: Decontamination of Soil Sampling Equipment, and SOP 6-1: Decontamination of Water Sampling Equipment). These SOPs will be followed during decontamination activities during the project.

2.3 Calibration of Field Instruments

Field instrumentation such as photoionization detectors, flame ionization detectors, pH/specific conductivity meters, turbidity meters, and oxygen/combustible gas meters may be used during the VAP Phase II investigation. Calibration of all field instruments used will be conducted following the Payne Firm's SOPs for each instrument and/or according to the manufacture's recommendations. At a minimum, each instrument requiring calibration will be calibrated prior to each use in the field.

2.4 Documentation and Record Maintenance

Field logbooks will be used to document information such as events, observations, and measurements obtained in the field during the VAP Phase II investigation. The Payne Firm SOP 1-1: Use of Field Logbooks will be followed while using field logbooks. Copies of daily logbook entries will be placed into the project file. Once the logbook is complete, the logbook will also be placed into the project file.

Calibration information will be recorded each time an instrument is calibrated. This information will be recorded in either the project logbook or the Payne Firm's general calibration log.

Field forms may also be used to document activities performed during the VAP Phase II investigation. Forms have been generated and are available for use to document such information as boring logs, monitoring well logs, and ground water sampling events. All completed forms will be placed into the project file when completed.

2.5 Sample Handling, Custody, Packaging, Preservation, and Holding Times

Environmental media collected at the property during the VAP Phase II investigation will be handled as described in the pertinent Payne Firm SOP (i.e., SOP 5-2: Soil Sampling, SOP 6-4: Ground Water Sampling). Appropriate personal protective equipment will be used to protect the individual conducting the sample handling.

Once samples are collected, appropriate handling of the collected samples will be followed. This includes the labeling of samples, the preservation of samples if required, appropriate packaging, and custody documentation of the samples. The Payne Firm SOPs have been developed and will be adhered to for these issues (SOP 1-3: Labeling and Custody of Samples, SOP 1-4: Packaging and Shipping Samples).

The VAP-certified laboratory for the project, Quanterra, Inc., North Canton, Ohio, will be contacted prior to each field event to obtain information about the need for sample preservation, the type of preservative to be used, and sample holding time.

3.0 LABORATORY QA/QC

QA/QC information from the VAP-certified laboratory for the analysis of samples will be reviewed to validate sample results. The primary areas addressed are the laboratory procedures and the validation of the laboratory results. While procedures related to geotechnical data are reviewed, this section primarily applies to the results of analyses for chemicals of concern (COCs), which are volatile organic compounds, polynuclear aromatic hydrocarbons, and the eight RCRA metals.

3.1 Laboratory Procedures

Analysis for potential COCs will be conducted using methods specified in the Phase II Property Assessment Report. All laboratory analyses will be performed at the project laboratory using U.S. EPA procedures and Level III analytical support (ASL III). Provisions will be made to ensure that detection limits enable evaluation of low action levels where necessary. All samples will be accompanied by appropriate laboratory QA/QC samples, including method blanks, matrix spikes and matrix spike duplicates, and laboratory control samples (VOCs only), as appropriate. The project laboratory will perform a review of all data under the direction of the laboratory QA officer. The laboratory QA officer will be responsible for assessing data quality and assigning any qualifications to the data based on established QC criteria. The laboratory will provide ASL III deliverables.

3.2 Review of Laboratory Data

An independent review of laboratory data by the Payne Firm will be conducted to ensure that all analytical data are usable, complete and comparable. The primary QA objective with respect to the review of accuracy, precision, and sensitivity of laboratory analytical data is to achieve the QC acceptance criteria of the analytical protocols. All data received from the project laboratory will be validated by the Payne Firm according to the protocols established by the U.S. EPA's Contract Laboratory Program National Functional Guidelines for organic and inorganic data (U.S. EPA, 1994). In general, the validation process will include a review of: laboratory adherence to QA procedures and precision and accuracy criteria; laboratory analysis and reporting; the presence of laboratory contamination; and any non-conformities or discrepancies in the analytical data base. After each field task is completed, a data validation memorandum will be prepared summarizing the results of the data validation, including any data qualifiers that were independently assigned to the analytical data base.

APPENDIX III

OHIO VAP RULES: OHIO ADMINISTRATIVE CODE 3745-300-04

3745-300-04 Certified Laboratories

(A) Definitions. As used in this rule:

(1) "Acceptance limit" means the numerical range within which an analyte must be quantitated to receive an acceptable result on a performance evaluation sample.

(2) "Additional certification" means certification under this rule to perform analyses of specific analytes, parameter groups or methods in addition to a laboratory's current certification under this rule.

(3) "Analyte" means a hazardous substance or petroleum, or a constituent of a hazardous substance or petroleum, that is tested in a sample.

(4) "Certificate" means the document issued by the director to an individual laboratory facility certified under this rule that authorizes it to perform analyses in support of a request for a no further action letter for the specified analytes or parameter groups, and using the methods set forth in the document, for which it is certified.

(5) "Certified or certification" means the authorization of a laboratory under this rule to perform analyses in support of a request for an no further action letter, for the specific analytes or parameter groups and using the methods, for which the director has determined the laboratory meets all requirements set forth in this rule.

(6) "Compliance audit" means an inspection of a laboratory, any documents, or property on which a voluntary action was or is being conducted and for which the laboratory performed analyses, to determine compliance with this rule, this chapter and all applicable requirements of Chapter 3746. of the Revised Code.

(7) "Conflict of interest" means any circumstances which would affect the laboratory's ability to objectively analyze samples in connection with a voluntary action, including circumstances similar to those set forth in paragraph (F)(3) of rule 3745-300-05 of the Administrative Code for certified professionals.

(8) "Initial certification" means any first certification under this rule issued to a laboratory to perform analyses of specific analytes, parameter groups or methods.

(9) "Method" means an analytical procedure provided for by paragraph (C) of this rule to quantitate analytes or parameter groups.

(10) "Parameter group" means a group of analytes similar in chemical characteristics quantitated using similar techniques.

(11) "Performance evaluation sample" means a material spiked with a known concentration of one or more specific analytes used to evaluate a laboratory's ability to identify and quantitate for a specific analyte or parameter group using a specific method.

(12) "Quality assurance program plan" means a written document detailing the data collection, storage, analysis, and quality assurance/quality control procedures used by a laboratory to assure that all data generated are scientifically valid, defensible, and of known precision and accuracy.

(13) "Renewal certification" means the renewal in accordance with this rule of a laboratory's current certification under this rule.

(14) "Standard operating procedures" mean a laboratory's written procedures to perform measurements of specified analytes or parameter groups, which include but are not limited to procedures for calibrations, corrective actions, quality control, and quantitative analysis.

(15) "System audit" means a scheduled on-site inspection of a laboratory, its administrative and technical procedures, instrumentation and personnel to evaluate the laboratory with regard to certification under this rule.

(B) Authority of a certified laboratory to perform analyses in support of a request for a no further action letter.

(1) The certified laboratory may perform analyses to support a request for a no further action letter only when consistent with the laboratory's current certificate. In order to provide certified data in support of a request for a no further action letter, a laboratory must be certified for each analyte, parameter group and method used at the time it performs such analyses, and must perform such analyses in accordance with the laboratory's certification. The laboratory may only perform analyses in support of a request for a no further action letter pursuant to the standard operating procedures and quality assurance program plan for which the laboratory has received prior approval from the agency.

(2) Certification pursuant to this rule is applicable only to analyses conducted in support of a request for a no further action letter under this chapter and Chapter 3746. of the Revised Code. Certification pursuant to this rule does not constitute certification to perform analyses under any other state or federal laboratory certification program.

(3) For asbestos analyses in support of a request for a no further action letter, the certified laboratory must maintain the accreditation provided in paragraph (C)(1)(d) of this rule upon which the laboratory was certified.

(C) Methods for the analyses of hazardous substances or petroleum, or constituents of hazardous substances or petroleum.

(1) Laboratories seeking certification under this rule may apply for certification pursuant to this rule to analyze for any hazardous substance or petroleum, or for constituents of hazardous substances or petroleum, using any of the following methods, except as provided in paragraph (C)(2) of this rule:

(a) Published or endorsed methods for the analyses of analytes or parameter groups. A laboratory may apply for certification under this rule using any analytical method published or endorsed by the United States Environmental Protection Agency or the agency. For the purpose of this rule, "endorsed" means those methods referenced for use in United States Environmental Protection Agency regulations, or referenced for use in rules adopted by the director of environmental protection.

(b) Sediment toxicity methods. In addition to any methods provided for in paragraph (C)(1)(a) of this rule, a laboratory may apply for certification under this rule for the following sediment toxicity methods:

(i) Ohio EPA, "Hyalella Azteca Solid Phase Toxicity Testing Procedure," September, 1994;

(ii) United States Environmental Protection Agency, "Methods for Measuring the Toxicity and Bioaccumulation of Sediment-associated Contaminants with Freshwater Invertebrates," June 1994; and

(iii) United States Environmental Protection Agency, "Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Water to Freshwater Organisms," July 1994.

(c) Performance-based methods. At the request of a laboratory, the agency may evaluate whether to certify the laboratory to perform analyses using a performance-based method. A "performance-based method" means for the purpose of this rule any analyte that is not listed in a published or endorsed method as provided in paragraph (c)(1)(a) of this rule. A laboratory applying for certification using a performance-based method must submit, in addition to the information required for certification by paragraph (e)(1) of this rule, laboratory check sample and matrix spike data for each analyte and matrix, including the statistical limits established using laboratory check sample and matrix spike data for which the laboratory is applying for certification.

(d) Requirements for the analysis of asbestos. In addition to the information required in the application for certification by paragraph (e) of this rule, a laboratory applying for certification under this rule for the analysis of asbestos must possess and submit documentation demonstrating its current accreditation by one or both of the following:

(i) The "American Industrial Hygiene Association", Asbestos Analysts Registry; or

(ii) The "National Institute of Standards Technology", National Voluntary Laboratory Accreditation Program for Asbestos Fiber Analysis.

(2) Testing for characteristic hazardous waste or for radioactive materials or constituents is not included for certification under the "Voluntary Action Program" and this rule.

(D) Performance Evaluation Programs.

(1) Initial performance evaluation program. Each laboratory applying for initial or additional certification under this rule must participate in the following performance evaluation program:

(a) Initial performance evaluation samples will be used to determine if a laboratory is qualified to analyze each analyte and parameter group for which the laboratory intends to apply for certification using the methods provided for in paragraph (C)(1)(a) of this rule.

(b) A laboratory must obtain an acceptable initial performance evaluation sample result for each analyte and parameter group using the method for which the laboratory intends to apply for certification. An "acceptable initial performance evaluation sample result" is determined as follows:

(i) Each analyte and parameter group must be quantitated within its acceptance limit before a laboratory may apply for certification for that analyte or parameter group and the method used for quantitation.

(ii) As provided in this paragraph, a laboratory may make two attempts to quantitate within the acceptance limit the analyte contained in an initial performance evaluation sample. A laboratory failing to quantitate an analyte within its acceptance limit in the first, initial performance evaluation sample may analyze a second, initial performance evaluation sample ("retake sample") for the failed analyte. The laboratory must analyze the retake sample within sixty days after the report date of the failed performance evaluation result. For each analyte the laboratory fails to quantitate within an acceptable limit in the first, initial performance evaluation sample, quantitation of the analyte must be within the acceptance limits in the retake sample for the laboratory to apply for certification for that analyte or its parameter group and method.

(iii) A laboratory failing to obtain an acceptable initial performance evaluation sample result for an analyte or parameter group and method must wait a period of ninety days after the report date of the retake sample results to analyze any additional initial performance evaluation samples for the failed analyte, parameter group or method. Analyses of additional initial performance evaluation samples must be in accordance with paragraphs (D)(1)(b)(i) and (ii) of this rule.

(2) Periodic performance evaluation program. Certified laboratories seeking to maintain or renew certification under this rule must participate in the following periodic performance evaluation program:

(a) Periodic performance evaluation samples will be used to maintain and renew certification, and will be administered semi-annually by the agency or its contractor. Certified laboratories must obtain acceptable periodic performance evaluation sample results to maintain or renew certification for certified analytes or parameter groups and methods.

(b) For the purposes of maintaining and renewing certification for a specified analyte or parameter group and method, "acceptable periodic performance evaluation sample results" mean that the same analyte must be quantitated within the acceptance limit in at least one of two consecutive periodic performance evaluation samples. A laboratory failing to obtain acceptable periodic performance evaluation sample results for an analyte or parameter group and method must wait until the next semi-annually administered periodic performance evaluation program to analyze any additional periodic performance evaluation sample for the failed analyte, parameter group or method.

[Comment: paragraph (P) of this rule provides the director must revoke or suspend a laboratory's certification for a particular analyte or parameter group and method if the laboratory does not receive acceptable periodic performance evaluation sample results for the analyte and method. Paragraph (G) of this rule provides the procedures for the reinstatement of a suspended analyte or parameter group and method. The procedures include the analysis of a "reinstatement sample" limited to the suspended analyte and method.]

(3) Both initial and periodic performance evaluation programs will be based on selecting specific analytes which are representative of a parameter group or parameter groups. The agency will determine the analytes to be used to evaluate a laboratory's performance.

(4) Each laboratory must pay for the actual costs of its participation in the initial and periodic performance evaluation programs pursuant to rule 3745-300-03 of the Administrative Code.

(E) Content of applications for certification.

(1) Initial certification and additional certification. To apply under this rule for initial certification or additional certification, as appropriate, a laboratory must submit to the agency a complete certification application. A complete certification application consists of at a minimum all of the following:

(a) A completed application for initial or additional certification, as appropriate, on the form provided by the agency;

(b) A written copy of the laboratory's quality assurance program plan;

[Comment: for additional certification, the laboratory's current approved quality assurance quality assurance program plan may fulfill the requirement of paragraph (E)(1)(b) of this rule provided the analyte, parameter group and method for which the laboratory is applying for additional certification is accounted for in the current approved plan.]

(c) Demonstration of acceptable initial performance evaluation sample results pursuant to paragraph (D)(1) of this rule, by including an original report of the laboratory's acceptable initial performance evaluation sample results for each analyte or parameter group and using the method for which the laboratory is applying for certification. This requirement applies only to the methods provided under paragraphs (C)(1)(a) and (C)(1)(c) of this rule. Except for a method provided in paragraph (C)(1)(b) or (C) of this rule or with prior approval by the agency, a laboratory may not apply for certification for any analyte or parameter group and method for which it did not receive an acceptable initial performance evaluation sample result.

(d) For asbestos certification, a photocopy of the laboratory's certificate or other form of documentation demonstrating the laboratory's current accreditation pursuant to paragraph (C)(1)(d) of this rule;

(e) Standard operating procedures for each analyte, parameter group and method for which the laboratory is applying for certification, except for asbestos for which the laboratory must demonstrate its accreditation, pursuant to paragraph (C)(1)(d) of this rule;

(f) A method detection limit study developed in accordance with appendix B of 40 CRF part 136, for each analyte, parameter group and method for which the laboratory is applying for certification, except for the methods provided under paragraph (C)(1)(b) and (C)(1)(d) of this rule; and

(g) Payment of the non-refundable fee for initial certification or additional certification, as established in rule 3745-300-03 of the Administrative Code.

(2) Renewal certification. To apply for renewal certification under this rule, a certified laboratory must submit to the agency at least ninety but not more than one hundred twenty days before the laboratory's certification expires, a complete renewal certification application. A complete renewal certification application consists of at a minimum all of the following:

(a) A completed renewal application on the form provided by the agency;

(b) Payment of the non-refundable annual fee for renewal certification, as established in rule 3745-300-03 of the Administrative Code;

(c) For renewal of asbestos certification, a photocopy of the certificate or other form of documentation demonstrating the laboratory's current accreditation pursuant to paragraph (C)(1)(d) of this rule; and

(d) A statement by an authorized representative of the certified laboratory, under affidavit pursuant to paragraph (E)(3) of this rule, that the laboratory received acceptable periodic performance evaluation sample results, as provided in paragraph (D)(2)(b) of this rule, for each analyte or parameter group and method for which the certified laboratory is applying for renewal certification. This requirement applies to methods provided in paragraphs (C)(1)(a) and (C)(1)(c) of this rule. A laboratory may not apply to renew certification for any analyte or parameter group using a method for which it did not receive acceptable periodic performance evaluation sample results.

(3) Affidavit. The information submitted under paragraph (E)(1) or (E)(2) of this rule must be accompanied by an affidavit, signed by a person authorized to bind the laboratory, affirming that upon knowledge, information, and belief, all information submitted in support of the laboratory's certification request is true, accurate and complete.

(4) Certified laboratories may apply, separately or in conjunction with a request for additional certification or renewal certification, to remove from their certification a specified analyte, parameter group or method.

(5) Requests to revise approved standard operating procedures or a quality assurance program plan must be made in accordance with paragraph (H) of this rule, and submitted as a request independent from an application for additional certification or renewal certification.

(F) Criteria used in evaluating laboratories applying for initial certification and additional certification.

(1) The agency will complete the evaluation process in accordance with this rule for initial certification or additional certification within one hundred twenty days after receipt of a complete application submitted in accordance with this paragraph and paragraph (E) of this rule. The director will not consider any laboratory certification request complete which does not contain all of the information required by this rule.

(2) The agency will conduct a system audit prior to initial certification and may conduct a system audit prior to additional certification, in accordance with paragraph (K) of this rule.

(3) Within forty-five days after completion of the system audit, the agency will provide the laboratory a report which will indicate the deficiencies identified during the system audit requiring the laboratory to implement corrective actions to receive initial certification or additional certification.

(4) To become certified for initial certification or additional certification, a laboratory must demonstrate to the director's satisfaction all of the following:

(a) Acceptable initial performance evaluation sample results, standard operating procedures, and other documentation specified under paragraphs (C), (D) or (E) of this rule for each analyte or parameter group and method for which the laboratory is applying for certification;

(b) Acceptable performance by the laboratory on the system audit as set forth in paragraph (K) of this rule, including timely correction of the deficiencies identified by the agency, if any;

(c) Payment of all applicable fees and costs pursuant to rule 3745-300-03 of the Administrative Code; and

(d) That the laboratory possesses the capability to provide reliable and representative data and the integrity to satisfy the requirements of this rule and chapter 3746. of the revised code, using the information provided in the application for certification, including the laboratory's quality assurance program plan, standard operating procedures, method detection limit studies, and other information required by this rule or considered appropriate by the agency.

(5) Following successful completion of the requirements specified in paragraphs (C), (D), (E) and (F) of this rule, the director will provide to the laboratory a certificate identifying the analytes, parameter groups, and methods, for which the laboratory may perform analyses in support of a request for a no further action letter. The certificate automatically expires two years after the date of issuance, unless the laboratory's certificate is suspended, revoked, or renewed prior to the certificate's expiration. The certificate expiration date for additional certification is the same as that of the laboratory's initial certification or renewal certification, as applicable. The certificate only applies to the individual laboratory facility identified in the certificate.

[Comment: entities that own or operate multiple laboratory facilities that will e performing analyses in support of a request for a no further action letter must apply for and obtain separate certification for each facility.]

(G) Criteria used in evaluating certified laboratories applying for renewal certification.

(1) A certified laboratory may renew its certification under this rule for any analyte, parameter group, or method for which the laboratory is currently certified. A certified laboratory must have received acceptable periodic performance evaluation sample results, as provided in paragraph (D)(2)(b).

______(2) As provided in paragraph (E)(2) of this rule, to apply for renewal certification, the certified laboratory must submit a complete renewal application at least ninety but not more than one hundred twenty days before the certificate expires. Applications made after the certificate's expiration must be made as applications for initial certification in accordance with paragraphs (E)(1) and (S) of this rule.

[Comment: any renewal application submitted less than ninety days before the certificate's expiration date risks a lapse in certification.]

(3) The agency may perform a system audit or compliance audit in accordance with paragraph (K) of this rule.

(4) The director may deny a laboratory's application for renewal certification if the laboratory fails to satisfy one or more of the requirements of paragraphs (E)(2) or (G)(1) or (2) of this rule, or the laboratory fails to meet all standards of performance and conduct as set forth in paragraph (I) of this rule, as determined by the director.

(H) Procedures to request review of proposed revisions to approved standard operating procedures or an approved quality assurance program plan.

(1) A certified laboratory must receive prior approval from the agency before implementing any revision to approved standard operating procedures or an approved quality assurance program plan. To seek agency review of a proposed revision, the certified laboratory must submit to the agency the following information in a written request on company letterhead:

(a) A description of the purpose of the proposed revisions for which the certified laboratory is requesting agency approval; and

(b) A copy of the proposed revised standard operating procedures or quality assurance program plan, as applicable, for the agency's review.

(2) Upon receipt of the agency's written approval of the proposed revisions, the certified laboratory may conduct activities pursuant to the revised standard operating procedures or quality assurance program plan, as approved. The certified laboratory may not implement revisions to approved standard operating procedures or an approved quality assurance program plan in support of a request for a no further action letter until receipt of the agency's written approval of the revisions.

(3) The agency may recover its actual costs in reviewing the proposed revisions, pursuant to rule 3745-300-03 of the Administrative Code.

(I) Standards of performance and conduct for maintaining certification.

To maintain certification under this rule, a certified laboratory must:

(1) Perform analyses only for which the laboratory is certified pursuant to this rule, when these analyses are performed in support of a request for a no further action letter;

(2) Comply with the methods for which the laboratory is certified, when analyses are in support of a request for a no further action letter;

(3) Notify the agency, in writing, of:

(a) Any change in managerial personnel, which includes but is not limited to a person responsible for quality assurance related to the laboratory's certification under this rule;

(b) Any change in procedures that affects the laboratory's ability to perform analyses pursuant to this rule;

(c) Any change in name or ownership of the laboratory; and

(d) Any proposed relocation of the laboratory to a separate facility;

(4) Perform acceptably on each compliance audit and system audit conducted pursuant to this rule, and correct deficiencies identified by the agency in timely manner;

(5) Perform analyses in support of a request for a no further action letter in accordance with the laboratory's standard operating procedures and quality assurance program plan approved by the agency;

[Comment: the procedures for seeking agency approval for a proposed revision to approved standard operating procedures or an approved quality assurance program plan are contained in paragraph (H) of this rule.]

(6) Obtain acceptable periodic performance evaluation sample results, in accordance with paragraph (D)(2) of this rule;

(7) Provide data that is representative of the sample for which the laboratory is performing analyses, and will not cause a no further action letter to be inconsistent with an applicable standard developed under this chapter;

[Comment: the applicable standards calculated for a property in accordance with rules 3745-300-08 and 3745-300-09 of the Administrative Code may not be within the certified laboratory's reporting limits. A certified laboratory that performs analyses in support of a no further action letter must be capable of detecting the chemicals of concern on the property at or below the applicable standards.]

(8) Not falsify any information or sample results on any application, standard operating procedure, quality assurance program plan, performance evaluation sample, or any other submittal to the agency;

(9) Not perform analyses in support of a request for a no further action letter for which the laboratory has a conflict of interest;

(10) Provide the agency access to the laboratory's facility and documents, data, or information related to any voluntary action for the purposes of determining compliance with the requirements of this chapter, and Chapter 3746. of the Revised Code;

(11) Promptly and completely respond to all document requests made by the agency under this chapter and Chapter 3746. of the Revised Code.;

(12) Pay all costs and fees required by this rule and rule 3745-300-03 of the Administrative Code; and

(13) Submit all information, data, documents and reports in support of a request for a no further action letter by affidavit, as required by rule 3745-300-13 of the Administrative Code.

(J) Procedures for submittals under this rule.

All submittals to the agency required under this rule must be submitted to the Ohio EPA by certified mail, courier delivery or any other form of mail or delivery accompanied by a receipt.

(K) Compliance audits and system audits.

(1) The agency may conduct compliance audits of a laboratory and its documentation to determine if a laboratory has performed in compliance with this rule, and Chapter 3746. of the Revised Code. Compliance audits will consist of one or more of the following:

(a) Review of laboratory documentation including but not limited to, standard operating procedures, logbooks, record files, and data packages to determine compliance with the requirements of this rule;

(b) Interviews of laboratory personnel to determine qualifications and knowledge of personnel performing analyses and compliance of the laboratory with this rule; or

(c) An on-site inspection to determine compliance with the requirements established pursuant to this rule.

(2) The agency will conduct system audits to evaluate a laboratory's qualifications for initial certification become certified to perform any analyses in support of requests for no further action letters in accordance with the requirements established in this rule. The agency may also conduct a system audit in review of laboratories applying for additional certification or renewal certification, laboratories that have a change in managerial personnel, or have relocated laboratory operations.

(a) System audits will consist of one or more of the following:

(i) review of laboratory documentation including but not limited to: standard operating procedures, logbooks, record files, and data packages to determine if the laboratory meets the requirements of this rule;

(ii) interviews of laboratory personnel to determine qualifications and knowledge of personnel performing analyses for which it is applying for certification under this rule; or

(iii) an on-site inspection to determine if the laboratory is qualified to perform analyses pursuant to the requirements established in this rule.

(b) In order to receive initial certification or additional certification, the laboratory must correct the deficiencies, if any, identified by the agency during a system audit to the satisfaction of and within the time limits specified by the agency. Prior to applying for renewal of certification, the laboratory must correct the deficiencies, if any, identified by the agency during a system audit to the satisfaction of the agency.

(L) Display of laboratory certificates.

Each certified laboratory must display its current original certificate(s) in a prominent location on the certified laboratory's premises.

(M) Retention of documents.

A laboratory must retain all documents prepared or acquired in connection with a voluntary action for a period of at least ten years after the date that the laboratory's analyses were submitted to a certified professional or volunteer. After ten years, if a laboratory does not intend to retain such documents, the laboratory must notify the agency by certified mail of such intent and provide the agency the opportunity to retain the documents. The documents must be retained until the notice described above is provided to the agency, and the agency notifies the laboratory in writing that the agency will or will not retain the documents. Notification of the agency pursuant to this paragraph is not required as long as a laboratory continues to retain all documents.

(N) Out-of-state laboratories.

As a condition of certification under this rule, laboratories located outside the state of Ohio consent to service of process and to personal jurisdiction of any Ohio court or the Ohio Environmental Review Appeals Commission in proceedings that adjudicate any rights or obligations under this chapter, and Chapter 3746. of the Revised Code, or in which the cause of action involves, in whole or in part, the laboratory's performance under this chapter or Chapter 3746. of the Revised Code. Out-of-state laboratories also consent to the agency's right of entry for inspection or investigation, and to the service of administrative warrants, inspection warrants, or other appropriate search warrants as a condition of certification under this rule.

(O) Appeal of certification determinations.

The issuance, denial, suspension, or revocation of any laboratory certification is a final action of the director, which is subject to the procedure for appeal set forth in Chapter 3745. of the Revised Code.

(P) Revocation or suspension of certification.

(1) The director may revoke or suspend a laboratory's certification issued pursuant to this rule, for a period to be determined by the director, upon finding that a laboratory failed to comply with any of the requirements set forth in paragraph (I) of this rule, except as provided in paragraphs (P)(2) and (P)(3) of this rule.

(2) The director must permanently revoke a laboratory's certification if the laboratory does not comply with document or data requests made by the agency, in violation of paragraph (I)(10) of this rule, or falsifies any information in connection with its certification or any voluntary action in violation of paragraph (I)(8) of this rule.

(3) The director must suspend or revoke a laboratory's certification for an analyte or parameter group, and method, if the laboratory fails to comply with the requirements set forth in paragraphs (D)(2) and (I)(6) of this rule.

(4) Upon revocation or suspension of an analyte or parameter group and method, the laboratory must return to the agency each certificate that identifies the analyte or parameter group and method.

(Q) Reinstatement of certification following suspension.

(1) A laboratory may request to reinstate its certification for a suspended analyte or parameter group and method after the termination of the suspension period of the certification.

(2) Beginning after the termination of the suspension period of the certification, the certified laboratory may analyze a reinstatement sample received from the agency or its contractor for the suspended analyte or parameter group and method. The certified laboratory must achieve acceptable results on the reinstatement sample for the analyte and method that resulted in the suspension to qualify for reinstatement of certification for a suspended analyte or parameter group and method.

(3) To request reinstatement of certification for a suspended analyte or parameter group and method, a certified laboratory must submit to the agency at a minimum the following:

(a) A written request on company letterhead identifying the analytes, parameter groups and methods for which the certified laboratory is requesting reinstatement; and

(b) An original report of the acceptable reinstatement sample result for each analyte or parameter group and method for which the certified laboratory is requesting reinstatement.

(4) The agency may recover its actual costs in reviewing requests for reinstatement, pursuant to rule 3745-300-03 of the Administrative Code.

(R) Certification following revocation of certification.

A laboratory whose certification has been revoked may apply for initial certification following termination of the revocation period imposed by the director. The laboratory's application for certification must comply with the requirements for initial certification as set forth in paragraphs (E) and (F) of this rule.

(S) Recertification following expiration of certification.

A laboratory whose certification has expired may apply for recertification. The laboratory's application for recertification must comply with the requirements for initial certification set forth in paragraphs (E) and (F) of this rule.

Replaces: former 3745-300-04

Effective: March 4, 2002

Certification: Christopher Jones, Director
Ohio Environmental Protection Agency

Date: February 21, 2002

Promulgated under: RC Chapter 119.

Rule amplified: RC Chapter 3746.

Rule authorized by: RC 3746.04

Prior effective dates: none

ORC 119.032 review date: March 4, 2007

APPENDIX IV

SEVERN TRENT LABORATORIES, INC. CORRESPONDENCE

SEVERN TRENT STL

STL North Canton
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November 3, 2003

Mr. David Contant
The Payne Firm, Inc.
11231 Cornell Park Drive
Cincinnati, OH 45242

Reference: Vernay Laboratories, Inc.
RCRA Corrective Action
Yellow Springs, Ohio

Dear Mr. Contant:

This letter is intended to assist you and the USEPA in determining if data provided by STL North Canton during Vernay's Ohio Voluntary Action Program investigation is "clearly acceptable historical data," as defined in EPA's *Region 5 Policy and Guidance Regarding Historical Data Usage in the RCRA Facility*.

As evidence that the Ohio VAP data generated by this laboratory from 1998 to 2001 is of known and acceptable quality, and compatible with the RFI data needs, we are providing information regarding the laboratory's qualifications to perform the work. These include **certifications** held by the laboratory, **performance evaluations** of the laboratory, and **experience** working on a wide variety of other Region 5 RCRA projects. In addition to these three "quality" components, the laboratory's **quality management plan** is an important indicator of our ability to support data quality. All of these quality components are described in more detail below.

A. Certifications

Certifications are one measure of a laboratory's quality standard.

STL North Canton performed the work in question in compliance with, and under certification by Ohio's Voluntary Action Program (VAP), inasmuch as the parameters analyzed appeared on the VAP certificate in place at the time of performance. Copies of STL North Canton's VAP certificates dating back to 1997 have been provided as an attachment to this letter.

Other nationally recognized certifications held by the laboratory include:

- NELAP certification – The National Environmental Laboratory Accreditation Conference (NELAC) is a voluntary association of State and Federal agencies whose purpose is to establish and promote mutually acceptable performance standards for the operation of environmental laboratories. (Primary certifications are held in New York & Florida, with secondary certifications in many other states that have adopted the program. A copy of the laboratory's most recent Florida NELAC certificate is provided as an attachment to this letter.)

- United States Army Corps of Engineers and NFESC Navy Lab Approval Programs

- In addition to certification by the states of Ohio, New York and Florida, STL North Canton holds secondary NELAC or state specific certifications (where the state has not adopted the NELAC program) in 21 other states.

B. Performance Evaluations

Federal, state and private sector clients routinely evaluate STL's laboratories. This is done by analysis of Performance Evaluation (PE) samples – both single blind and double blind, and by on-site audits.

PE samples can determine a laboratory's ability to measure concentrations of a very select set of project specific analytes, or can measure performance on a very large list of analytes up to and including the full Appendix IX list. Audits include not only a review of analytical performance, but also of the administrative functions such as customer service, project management and invoicing.

STL North Canton has analyzed a variety of proficiency testing (PT) samples and has been audited for accreditation by the Ohio EPA, by the state environmental agencies of New York and Florida as outlined in the National Environmental Laboratory Accreditation Conference (NELAC), by the Army Corps of Engineers Laboratory Assessment program, as well as by a variety of other state agencies and private clients.

Summaries of proficiency testing scores for 1997 through 2003 have been provided as an attachment to this letter. In addition, a copy of the laboratory's Ohio VAP audit report from 1996 (the year prior to the start of the Vernay project), and a copy of our Florida audit response from 2002 are included as evidence of laboratory acceptability.

C. Experience

STL North Canton has worked for many years on a wide variety of projects under Region 5 oversight, and using quality assurance project plans approved by Region 5 personnel (a partial experience table is provided as an attachment). As a part of the QAPP process, the laboratory's standard operating procedures have been scrutinized and approved by the agency many times. Some project examples include:

- Steel Industry Project (oversight by Region 5) – STL North Canton is the lead laboratory in the implementation of the largest ISM/RFI ever undertaken by USEPA Region 5. The laboratory was integrally involved in the process of QAPP development, including attendance at pre-QAPP meetings with the client and USEPA. The analytical budget is projected to be $10 million over a ten-year period, with a team of consultants used to administer the environmental programs. The analytical scope includes full Appendix IX parameters along with a variety of standard and non-standard treatability and natural attenuation parameters. Full CLP-like data packages and specialized electronic deliverables are being provided to the client on an ongoing basis.

- Petroleum Industry Project (oversight by state of Ohio) – STL North Canton is the lead lab on an RFI for a national petroleum manufacturer. The analytical budget is approximately $350,000 per year, and the analytical scope demonstrates the laboratory's experience with difficult matrices and standard analyte lists (TCL) as well as specialized analyte lists, such as the Skinner List, that are specifically associated with petroleum refinery sites.

- Auto Industry Project (oversight by Region 5 & MDEP) – STL North Canton, working side-by-side with a third party consultant, has been involved for many years in various stages of investigation and cleanup for one of the major automotive companies in the United States. The analytical budget for this program, to date, has been approximately $1.25 million and has frequently involved multiple teaming laboratories, with centralized project management governed by STL North Canton.

D. Quality Management

STL management is committed to providing the highest quality data and the best service in the environmental testing industry. To ensure that the data produced and reported by STL laboratories meet the requirements of its clients, and comply with the letter and spirit of municipal, state and federal regulations, STL maintains a Quality System that is clear, effective, well communicated, and supported at all levels of the company. This same quality system was in place within the North Canton laboratory under the Quanterra Laboratory network that preceded STL's ownership of the laboratory.

The Quality System is designed to provide a framework for continuous improvement within the organization, minimize systematic error, and encourage constructive, documented problem solving. The core of the system is established and communicated via a corporate Quality Management Plan (QMP). The QMP provides the framework within which project-specific planning, implementation and performance assessment may occur.

The QMP is supplemented by facility specific Laboratory Quality Manuals (LQMs), which spell out quality processes and procedures at the local level. These documents detail information unique to each facility laboratory, such as the QA organizational structure, key personnel, and operations information such as analyte lists and control criteria.

Standard Operation Procedures (SOPs), based on the applicable SW846, EPA, Standard Method, or other approved analytical procedure, have been developed for each test performed which break down the analytical processes to their fine details.

STL North Canton has worked closely with EPA Region 5's Quality Assurance and Project Managers to ensure that the laboratory's quality systems, analytical processes and standard operating procedures (SOPs) comply with the letter and spirit of the Region's RI/FS requirements. The laboratory has participated in QAPP development for a wide variety of projects using Region 5's Model QAPP (EPA QA/R-5) as the guide.

We believe that the details provided above adequately support the fact that the Ohio VAP data generated for Vernay Laboratories from 1998 to 2001 is "of known and acceptable quality." Although the data provided to The Payne Firm did not include full extended data deliverables (raw data, bench sheets, etc.), it did include sufficient QC information (method blanks, laboratory control samples, surrogate and spike recoveries and RPDs) for data validation. If necessary, the laboratory could go back to the original data and build extended data packages for much of the Ohio VAP data, although to do so retroactively and is an expensive and time consuming process.

If you need additional information or clarification on any of the details provided in the letter or the associated attachments, please don't hesitate to call me at 330 966 9792.

Sincerely,

Rebecca Strait

Rebecca L. Strait
Manager of Client Services

Scope. This certificate applies only to the Ohio EPA Voluntary Action Program. The certified laboratory identified herein is authorized to perform analyses in support of no further action letters for the analytes, parameter groups, and methods which are identified on the face of this certificate, so long as this certificate remains effective. The laboratory is prohibited from performing any analyses in support of a no further action letter for any analyte or parameter group, or using any method that is not identified in this certificate. This certificate hereby modifies and supersedes any other Voluntary Action Program certificate issued to the laboratory prior to the date of this certificate. For parameter groups, this certificate authorizes analysis of only those compounds listed in the methods identified herein. This certificate does not authorize analysis of compounds which may meet a general criteria or description provided for in such methods, but are not listed.

Limitation. This certificate does not apply to any other Ohio EPA program nor does it serve any purpose other than that described in the "Scope" section. This certificate is subject to renewal under OAC rule 3745-300-04.

Obligations and Responsibilities. As a condition of certification, the certified laboratory accepts all obligations and responsibilities of a certified laboratory in the Voluntary Action Program, as set forth in ORC Chapter 3746 and OAC Chapter 3745-300, including but not limited to compliance with the standards of performance and conduct for maintaining certification under paragraph (I) of rule 3745-300-04. The certified laboratory must display the original certificate in a prominent location on its premises.

Revocation or Suspension. This certificate is subject to suspension or revocation in accordance with OAC Chapter 3745-300. The authorization provided by this certificate ceases upon the effective date of the suspension or revocation.

This certificate is the property of Ohio EPA and must be surrendered to Ohio EPA upon expiration, revocation, or suspension of the laboratory's certification.

OHIO E.P.A.

SEP 26 2003

ENTERED DIRECTOR'S JOURNAL

Ohio Environmental Protection Agency

Division of Emergency and Remedial Response

Voluntary Action Program

Under the authority of Ohio Revised Code Section 3746.04(B)(6) and Ohio Administrative Code Rule 3745-300-04

Certifies

STL North Canton

4101 Shuffel Drive, NW

North Canton, OH 44720

as a

Certified Laboratory

(Number CL0024)

for the following analytes, parameter groups, and methods:

Aluminum/6010B	Cobalt/6010B, 6020	Silver/6010B, 6020	Total Phenolics/420.1*, 9065*	Organochlorine Pesticides/8081A
Antimony/6010B, 6020	Copper/6010B, 6020	Sodium/6010B	Chloride/9251*,300.0	Polynuclear Aromatic Hydrocarbons/610*, 8310
Arsenic/6010B, 6020	Cyanide, Total/335.2(CLP-M)	Thallium/6010B, 6020	Phosphate/365.2*	Semi-Volatile Organic Compounds/8270C
Barium/6010B, 6020	Iron/6010B	Vanadium/6010B	Fluoride/300.0	Volatile Organic Compounds/602*,8260A, 8260B, 8021B
Beryllium/6010B, 6020	Lead/6010B, 6020	Zinc/6010B, 6020	Sulfate/300.0	N-Hexane/8260A-Modified, 8260B-Modified
Cadmium/6010B, 6020	Manganese/6010B, 6020	Selenium/6010B	Nitrate/300.0	Hexavalent Chromium/7196A
Calcium/6010B	Mercury/7470A*,7471A	Potassium/6010B	Bromide/300.0	Total Petroleum Hydrocarbons Only, Diesel Range Organics/8015B
Chromium/6010B, 6020	Nickel/6010B, 6020	Polychlorinated Biphenyls/8082	Phosphorus/365.2*	Total Petroleum Hydrocarbons, Gasoline Range Organics/8015A-Modified
	*Water Only	n-Hexane Extractable Material/1664A*	Chlorinated Herbicides/8151A	

SEP 25

Date of Certification

Director, Ohio Environmental Protection Agency

SEP 24 2004

Date of Expiration

Manager, Voluntary Action Program

SCOPE, LIMITATION, OBLIGATIONS AND RESPONSIBILITIES OF CERTIFICATION ON REVERSE SIDE

Scope. This certificate applies only to the Ohio EPA Voluntary Action Program. The certified laboratory identified herein is authorized to perform analyses in support of no further action letters for the analytes, parameter groups, and methods which are identified on the face of this certificate, so long as this certificate remains effective. The laboratory is prohibited from performing any analyses in support of a no further action letter for any analyte or parameter group, or using any method that is not identified in this certificate. This certificate hereby modifies and supersedes any other Voluntary Action Program certificate issued to the laboratory prior to the date of this certificate. For parameter groups, this certificate authorizes analysis of only those compounds listed in the methods identified herein. This certificate does not authorize analysis of compounds which may meet a general criteria or description provided for in such methods, but are not listed.

Limitation. This certificate does not apply to any other Ohio EPA program nor does it serve any purpose other than that described in the "Scope" section. This certificate is subject to renewal under OAC rule 3745-300-04.

Obligations and Responsibilities. As a condition of certification, the certified laboratory accepts all obligations and responsibilities of a certified laboratory in the Voluntary Action Program as set forth in ORC Chapter 3746, and OAC Chapter 3745-300, including but not limited to compliance with the standards of performance and conduct for maintaining certification under paragraph (I) of rule 3745-300-04. The certified laboratory must display the original certificate in a prominent location on its premises.

Revocation or Suspension. This certificate is subject to suspension or revocation in accordance with OAC Chapter 3745-300. The authorization provided by this certificate ceases upon the effective date of the suspension or revocation.

This certificate is the property of Ohio EPA and must be surrendered to Ohio EPA upon expiration, revocation, or suspension of the laboratory's certification.

Ohio Environmental Protection Agency
Division of Emergency and Remedial Response
Voluntary Action Program

Under the authority of Ohio Revised Code Section 3746.04(B)(6) and Ohio Administrative Code Rule 3745-300-04

Certifies

STL North Canton

4101 Shuffel Drive, NW
North Canton, OH 44720

as a

Certified Laboratory

(Number CL0024)

for the following analytes, parameter groups, and methods:

Aluminum/6010B	Cobalt/6010B, 6020	Silver/6010B, 6020	Total Phenolics/420.1*, 9065*	Organochlorine Pesticides/8081A
Antimony/6010B, 6020	Copper/6010B, 6020	Sodium/6010B	Chloride/9251*,300.0	Polynuclear Aromatic Hydrocarbons/610*, 8310
Arsenic/6010B, 6020	Cyanide, Total/335.2(CLP-M)	Thallium/6010B,7841, 6020	Phosphate/365.2*	Semi-Volatile Organic Compounds/8270C
Barium/6010B, 6020	Iron/6010B	Vanadium/6010B	Fluoride/300.0	Volatile Organic Compounds/602*,8260A, 8260B, 8021B
Beryllium/6010B, 6020	Lead/6010B, 6020	Zinc/6010B, 6020	Sulfate/300.0	N-Hexane/8260A-Modified, 8260B-Modified
Cadmium/6010B, 6020	Manganese/6010B, 6020	Selenium/6010B	Nitrate/300.0	Total Petroleum Hydrocarbons/418.1*
Calcium/6010B	Mercury/7470A*,7471A	Potassium/6010B	Bromide/300.0	Total Petroleum Hydrocarbons Only, Diesel Range Organics/8015B
Chromium/6010B, 6020	Nickel/6010B, 6020	Polychlorinated Biphenyls/8082	Phosphorus/365.2*	Total Petroleum Hydrocarbons, Gasoline Range Organics/8015A-Modified
	*Water Only	n-Hexane Extractable Material/1664A*	Chlorinated Herbicides/8151A	Hexavalent Chromium/7196A

JUL 2 2003
Date of Certification

Director, Ohio Environmental Protection Agency

SEP 24 2004
Date of Expiration

Manager, Voluntary Action Program

SCOPE, LIMITATION, OBLIGATIONS AND RESPONSIBILITIES OF CERTIFICATION ON REVERSE SIDE

Scope. This certificate applies only to the Ohio EPA Voluntary Action Program. The certified laboratory identified herein is authorized to perform analyses in support of no further action letters for the analytes, parameter groups, and methods which are identified on the face of this certificate, so long as this certificate remains effective. The laboratory is prohibited from performing any analyses in support of a no further action letter for any analyte or parameter group, or using any method that is not identified in this certificate. This certificate hereby modifies and supersedes any other Voluntary Action Program certificate issued to the laboratory prior to the date of this certificate. For parameter groups, this certificate authorizes analysis of only those compounds listed in the methods identified herein. This certificate does not authorize analysis of compounds which may meet a general criteria or description provided for in such methods, but are not listed.

Limitation. This certificate does not apply to any other Ohio EPA program nor does it serve any purpose other than that described in the "Scope" section. This certificate is subject to renewal under OAC rule 3745-300-04.

Obligations and Responsibilities. As a condition of certification, the certified laboratory accepts all obligations and responsibilities of a certified laboratory in the Voluntary Action Program, as set forth in ORC Chapter 3746. and OAC Chapter 3745-300, including but not limited to compliance with the standards of performance and conduct for maintaining certification under paragraph (I) of rule 3745-300-04. The certified laboratory must display the original certificate in a prominent location on its premises.

Revocation or Suspension. This certificate is subject to suspension or revocation in accordance with OAC Chapter 3745-300. The authorization provided by this certificate ceases upon the effective date of the suspension or revocation.

This certificate is the property of Ohio EPA and must be surrendered to Ohio EPA upon expiration, revocation, or suspension of the laboratory's certification.

Ohio Environmental Protection Agency

Division of Emergency and Remedial Response

Voluntary Action Program

Under the authority of Ohio Revised Code Section 3746.04(B)(6) and Ohio Administrative Code Rule 3745-300-04

Certifies

STL North Canton

4101 Shuffel Drive, NW
North Canton, OH 44720

as a

Certified Laboratory

(Number CL0024)

for the following analytes, parameter groups, and methods:

Aluminum/6010B	Cobalt/6010B	Silver/6010B	Total Phenolics/420.1*, 9065*	Organochlorine Pesticides/8081A
Antimony/6010B	Copper/6010B	Sodium/6010B	Chloride/9251*,300.0	Polynuclear Aromatic Hydrocarbons/610*, 8310
Arsenic/6010B	Cyanide/335.2(CLP-M)	Thallium/6010B,7841	Phosphate/365.2*	Semi-Volatile Organic Compounds/8270C
Barium/6010B	Iron/6010B	Vanadium/6010B	Fluoride/300.0	Volatile Organic Compounds/602*,8260A, 8260B, 8021B
Beryllium/6010B	Lead/6010B	Zinc/6010B	Sulfate/300.0	N-Hexane/8260A-Modified, 8260B-Modified
Cadmium/6010B	Manganese/6010B	Selenium/6010B	Nitrate/300.0	Total Petroleum Hydrocarbons/418.1*
Calcium/6010B	Mercury/7470A*,7471A	Potassium/6010B	Bromide/300.0	Total Petroleum Hydrocarbons Only, Diesel Range Organics/8015B
Chromium/6010B	Nickel/6010B	Polychlorinated	Phosphorus/365.2*	Total Petroleum Hydrocarbons, Gasoline Range Organics/8015A-Modified
			Chlorinated Herbicides/8151A	Hexavalent Chromium/7196A

*Water Only

SEP 24 2002
Date of Certification

Director, Ohio Environmental Protection Agency

SEP 24 2004
Date of Expiration

Manager, Voluntary Action Program

SCOPE, LIMITATION, OBLIGATIONS AND RESPONSIBILITIES OF CERTIFICATION ON REVERSE SIDE

Scope. This certificate applies only to the Ohio EPA Voluntary Action Program. The certified laboratory identified herein is authorized to perform analyses in support of no further action letters for the analytes, parameter groups, and methods which are identified on the face of this certificate, so long as this certificate remains effective. The laboratory is prohibited from performing any analyses in support of a no further action letter for any analyte or parameter group, or using any method that is not identified in this certificate. This certificate hereby modifies and supersedes any other Voluntary Action Program certificate issued to the laboratory prior to the date of this certificate. For parameter groups, this certificate authorizes analysis of only those compounds listed in the methods identified herein. This certificate does not authorize analysis of compounds which may meet a general criteria or description provided for in such methods, but are not listed.

Limitation. This certificate does not apply to any other Ohio EPA program nor does it serve any purpose other than that described in the "Scope" section. This certificate is subject to renewal under OAC rule 3745-300-04.

Obligations and Responsibilities. As a condition of certification, the certified laboratory accepts all obligations and responsibilities of a certified laboratory in the Voluntary Action Program, as set forth in ORC Chapter 3746, and OAC Chapter 3745-300, including but not limited to compliance with the standards of performance and conduct for maintaining certification under paragraph (I) of rule 3745-300-04. The certified laboratory must display the original certificate in a prominent location on its premises.

Revocation or Suspension. This certificate is subject to suspension or revocation in accordance with OAC Chapter 3745-300. The authorization provided by this certificate ceases upon the effective date of the suspension or revocation.

This certificate is the property of Ohio EPA and must be surrendered to Ohio EPA upon expiration, revocation, or suspension of the laboratory's certification.

OHIO E.P.A.
AUG -7 2002
ENTERED DIRECTOR'S JOURNAL

Ohio EPA

Ohio Environmental Protection Agency
Division of Emergency and Remedial Response
Voluntary Action Program

Under the authority of Ohio Revised Code Section 3746.04(B)(6) and Ohio Administrative Code Rule 3745-300-04

Certifies

STL North Canton

4101 Shuffel Drive, NW
North Canton, OH 44720

as a

Certified Laboratory

(Number CL0024)

for the following analytes, parameter groups, and methods:

Aluminum/6010B	Cobalt/6010B	Silver/6010B	Total Phenolics/420.1*, 9065*	Organochlorine Pesticides/8081A
Antimony/6010B	Copper/6010B	Sodium/6010B	Chloride/9251*,300.0	Polynuclear Aromatic Hydrocarbons/610*, 8310
Arsenic/6010B	Cyanide/335.2(CLP-M)	Thallium/6010B,7841	Phosphate/365.2*	Semi-Volatile Organic Compounds/8270C
Barium/6010B	Iron/6010B	Vanadium/6010B	Fluoride/300.0	Volatile Organic Compounds/602*,8260A, 8260B, 8021B
Beryllium/6010B	Lead/6010B	Zinc/6010B	Sulfate/300.0	N-Hexane/8260A-Modified, 8260B-Modified
Cadmium/6010B	Manganese/6010B	Selenium/6010B	Nitrate/300.0	Total Petroleum Hydrocarbons/418.1
Calcium/6010B	Mercury/7470A*,7471A	Potassium/6010B	Bromide/300.0	Total Petroleum Hydrocarbons Only, Diesel Range Organics/8015B
Chromium/6010B	Nickel/6010B	Polychlorinated Biphenyls/8082	Phosphorus/365.2*	Total Petroleum Hydrocarbons, Gasoline Range Organics/8015A-Modified
			Chlorinated Herbicides/8151A	Hexavalent Chromium/7196A

*Water Only

AUG 7 2002
Date of Certification

Christopher Jones/JK
Director, Ohio Environmental Protection Agency

NOV 21 2002
Date of Expiration

[illegible signature]
Manager, Voluntary Action Program

SCOPE, LIMITATION, OBLIGATIONS AND RESPONSIBILITIES OF CERTIFICATION ON REVERSE SIDE

Sc This certificate applies only to the Ohio EPA Voluntai ction Program. The certified laboratory identified herei authorized to perform analyses in support of no further action letters for the analytes, parameter groups, and methods which are identified on the face of this certificate, so long as this certificate remains effective. The laboratory is prohibited from performing any analyses in support of a no further action letter for any analyte or parameter group, or using any method that is not identified in this certificate. This certificate hereby modifies and supersedes any other Voluntary Action Program certificate issued to the laboratory prior to the date of this certificate. For parameter groups, this certificate authorizes analysis of only those compounds listed in the methods identified herein. This certificate does not authorize analysis of compounds which may meet a general criteria or description provided for in such methods, but are not listed.

Limitation. This certificate does not apply to any other Ohio EPA program nor does it serve any purpose other than that described in the "Scope" section. This certificate is subject to renewal under OAC rule 3745-300-04.

Obligations and Responsibilities. As a condition of certification, the certified laboratory accepts all obligations and responsibilities of a certified laboratory in the Voluntary Action Program as set forth in ORC Chapter 3746, and OAC Chapter 3745-300, including but not limited to compliance with the standards of performance and conduct for maintaining certification under paragraph (I) of rule 3745-300-04. The certified laboratory must display the original certificate in a prominent location on its premises.

Revocation or Suspension. This certificate is subject to suspension or revocation in accordance with OAC Chapter 3745-300. The authorization provided by this certificate ceases upon the effective date of the suspension or revocation.

This certificate is the property of Ohio EPA and must be surrendered to Ohio EPA upon expiration, revocation, or suspension of the laboratory's certification.

Ohio EPA

Ohio Environmental Protection Agency
Division of Emergency and Remedial Response
Voluntary Action Program

Under the authority of Ohio Revised Code Section 3746.04(B)(6) and Ohio Administrative Code Rule 3745-300-04

Certifies

STL North Canton

4101 Shuffel Drive, NW
North Canton, OH 44720

as a

Certified Laboratory

(Number CL0024)

for the following analytes, parameter groups, and methods:

Aluminum/6010B	Cobalt/6010B	Silver/6010B	Total Phenolics/420.1*	Organochlorine Pesticides/8081A
Antimony/6010B	Copper/6010B	Sodium/6010B	Chloride/9251*,300.0	Polynuclear Aromatic Hydrocarbons/610*, 8310
Arsenic/6010B	Cyanide/335.2(CLP-M)	Thallium/6010B,7841	Phosphate/365.2*	Semi-Volatile Organic Compounds/8270C
Barium/6010B	Iron/6010B	Vanadium/6010B	Fluoride/300.0	Volatile Organic Compounds/602*,8260A, 8260B, 8021B
Beryllium/6010B	Lead/6010B	Zinc/6010B	Sulfate/300.0	N-Hexane/8260A-Modified, 8260B-Modified
Cadmium/6010B	Manganese/6010B	Selenium/6010B	Nitrate/300.0	Total Petroleum Hydrocarbons/418.1
Calcium/6010B	Mercury/7470A*,7471A	Potassium/6010B	Bromide/300.0	Total Petroleum Hydrocarbons Only, Diesel Range Organics/8015B
Chromium/6010B	Nickel/6010B	Polychlorinated Biphenyls/8082	Phosphorus/365.2*	Total Petroleum Hydrocarbons, Gasoline Range Organics/8015A-Modified
				Hexavalent Chromium/7196A

*Water Only

JUN 26 2002
Date of Certification

Director, Ohio Environmental Protection Agency

NOV 21 2002
Date of Expiration

Manager, Voluntary Action Program

SCOPE, LIMITATION, OBLIGATIONS AND RESPONSIBILITIES OF CERTIFICATION ON REVERSE SIDE

ENTERED DIRECTOR'S JOURNAL
JUN 26 2002
OHIO E.P.A.

Scope. This certificate applies only to the Ohio EPA Voluntary Action Program. The certified laboratory identified herein is authorized to perform analyses in support of no further action letters for the analytes, parameter groups, and methods which are identified on the face of this certificate, so long as this certificate remains effective. The laboratory is prohibited from performing any analyses in support of a no further action letter for any analyte or parameter group, or using any method that is not identified in this certificate. This certificate hereby modifies and supersedes any other Voluntary Action Program certificate issued to the laboratory prior to the date of this certificate. For parameter groups, this certificate authorizes analysis of only those compounds listed in the methods identified herein. This certificate does not authorize analysis of compounds which may meet a general criteria or description provided for in such methods, but are not listed.

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Obligations and Responsibilities. As a condition of certification, the certified laboratory accepts all obligations and responsibilities of a certified laboratory in the Voluntary Action Program as set forth in ORC Chapter 3746. and OAC Chapter 3745-300, including but not limited to compliance with the standards of performance and conduct for maintaining certification under paragraph (I) of rule 3745-300-04. The certified laboratory must display the original certificate in a prominent location on its premises.

Revocation or Suspension. This certificate is subject to suspension or revocation in accordance with OAC Chapter 3745-300. The authorization provided by this certificate ceases upon the effective date of the suspension or revocation.

This certificate is the property of Ohio EPA and must be surrendered to Ohio EPA upon expiration, revocation, or suspension of the laboratory's certification.

Ohio EPA

Ohio Environmental Protection Agency
Division of Emergency and Remedial Response
Voluntary Action Program

ENTERED ... JOURNAL
MAY - 1 2002
OHIO E.P.A.

Under the authority of Ohio Revised Code Section 3746.04(B)(6) and Ohio Administrative Code Rule 3745-300-04

Certifies

STL North Canton

4101 Shuffel Drive, NW
North Canton, OH 44720

as a

Certified Laboratory

(Number CL0024)

for the following analytes, parameter groups, and methods:

Aluminum/6010B	Cobalt/6010B	Silver/6010B	Total Phenolics/420.1*	Organochlorine Pesticides/8081A
Antimony/6010B	Copper/6010B	Sodium/6010B	Chloride/9251*,300.0	Polynuclear Aromatic Hydrocarbons/610*, 8310
Arsenic/6010B	Cyanide/335.2(CLP-M)	Thallium/6010B,7841	Phosphate/365.2*	Semi-Volatile Organic Compounds/8270C
Barium/6010B	Iron/6010B	Vanadium/6010B	Fluoride/300.0	Volatile Organic Compounds/602*,8260A, 8260B, 8021B
Beryllium/6010B	Lead/6010B	Zinc/6010B	Sulfate/300.0	N-Hexane/8260A-Modified, 8260B-Modified
Cadmium/6010B	Manganese/6010B	Selenium/6010B	Nitrate/300.0	Total Petroleum Hydrocarbons, Diesel Range Organics/418.1
Calcium/6010B	Mercury/7470A*,7471A	Potassium/6010B	Bromide/300.0	Total Petroleum Hydrocarbons Only, Diesel Range Organics/8015B
Chromium/6010B	Nickel/6010B	Polychlorinated Biphenyls/8082	Phosphorus/365.2*	Total Petroleum Hydrocarbons, Gasoline Range Organics/8015A-Modified

*Water Only

MAY 1 2002
Date of Certification

Director, Ohio Environmental Protection Agency

... 2 1 2002
Date of Expiration

Manager, Voluntary Action Program

SCOPE, LIMITATION, OBLIGATIONS AND RESPONSIBILITIES OF CERTIFICATION ON REVERSE SIDE

Scope. This certificate applies only to the Ohio EPA Voluntary Action Program. The certified laboratory identified herein is authorized to perform analyses in support of no further action letters for the analytes, parameter groups, and methods which are identified on the face of this certificate, so long as this certificate remains effective. The laboratory is prohibited from performing any analyses in support of a no further action letter for any analyte or parameter group, or using any method that is not identified in this certificate. This certificate hereby modifies and supersedes any other Voluntary Action Program certificate issued to the laboratory prior to the date of this certificate. For parameter groups, this certificate authorizes analysis of only those compounds listed in the methods identified herein. This certificate does not authorize analysis of compounds which may meet a general criteria or description provided for in such methods, but are not listed.

Limitation. This certificate does not apply to any other Ohio EPA program nor does it serve any purpose other than that described in the "Scope" section. This certificate is subject to renewal under OAC rule 3745-300-04.

Obligations and Responsibilities. As a condition of certification, the certified laboratory accepts all obligations and responsibilities of a certified laboratory in the Voluntary Action Program, as set forth in ORC Chapter 3746 and OAC Chapter 3745-300, including but not limited to compliance with the standards of performance and conduct under paragraph (I) of rule 3745-300-04. The certified laboratory must display the original certificate in a prominent location on its premises.

Revocation or Suspension. This certificate is subject to suspension or revocation in accordance with OAC Chapter 3745-300. The authorization provided by this certificate ceases upon the effective date of the suspension or revocation.

This certificate is the property of Ohio EPA and must be surrendered to Ohio EPA upon expiration, revocation, or suspension of the laboratory's certification.

Ohio Environmental Protection Agency
Division of Emergency and Remedial Response
Voluntary Action Program

Under the authority of Ohio Revised Code Section 3746.04(B)(6) and Ohio Administrative Code Rule 3745-300-04

Certifies

Severn Trent Laboratories - North Canton

4101 Shuffel Drive, NW
North Canton, OH 44720

as a

Certified Laboratory

(Number CL0024)

for the following analytes, parameter groups, and methods:

Aluminum/6010B	Cobalt/6010B	Silver/6010B	Total Phenolics/9065*,420.1*	Organochlorine Pesticides/8081A
Antimony/6010B	Copper/6010B	Sodium/6010B	Chloride/9251*,300.0	Polynuclear Aromatic Hydrocarbons/610*
Arsenic/6010B	Cyanide/335.2(CLP-M)	Thallium/6010B,7841	Phosphate/365.2*,300.0	Semi-Volatile Organic Compounds/8270C
Barium/6010B	Iron/6010B	Vanadium/6010B	Fluoride/300.0	Volatile Organic Compounds/602*,8260A, 8260B
Beryllium/6010B	Lead/6010B	Zinc/6010B	Sulfate/300.0	N-Hexane/8260A-Modified**, 8260B-Modified**
Cadmium/6010B	Manganese/6010B	Selenium/6010B	Nitrate/300.0	Total Petroleum Hydrocarbons, Diesel Range Organics/418.1
Calcium/6010B	Mercury/7470A*,7471A	Potassium/6010B	Bromide/300.0	Total Petroleum Hydrocarbons Only, Diesel Range Organics/8015B
Chromium/6010B	Nickel/6010B	Polychlorinated Biphenyls/8082	Chlorinated Herbicides/8151A	Total Petroleum Hydrocarbons, Gasoline Range Organics/8015A-Modified

*Water Only **In accordance with all documentation submitted pursuant to OAC Rule 3745-300-04(0) and approved by the VAP.

NOV 21 2000
Date of Certification

Director, Ohio Environmental Protection Agency

NOV 21 2002
Date of Expiration

Manager, Voluntary Action Program

SCOPE, LIMITATION, OBLIGATIONS AND RESPONSIBILITIES OF CERTIFICATION ON REVERSE SIDE

Scope. This certificate applies only to the Ohio EPA Voluntary Action Program. The certified laboratory identified herein is authorized to perform analyses in support of no further action letters for the analytes, parameter groups, and methods which are identified in this certificate, so long as this certificate remains effective. The laboratory is prohibited from performing any analyses in support of a no further action letter for any analyte or parameter group, or using any method that is not identified in this certificate. This certificates hereby modifies and supersedes any other Voluntary Action Program certificate issued to the laboratory prior to the date of this certificate. For parameter groups, this certificate authorizes analysis of only those compounds listed in the methods identified herein. This certificate does not authorize analysis of compounds which may meet a general criteria or description provided for in such methods but are not listed.

Limitation. This certificate does not apply to any other Ohio EPA program nor does it serve any purpose other than that described in the "Scope" section. This certificate is subject to renewal under OAC rule 3745-300-04.

Obligations and Responsibilities. As a condition of certification, the certified laboratory accepts all obligations and responsibilities of a certified laboratory in the Voluntary Action Program, as set forth in ORC Chapter 3746. and OAC Chapter 3745-300, including but not limited to compliance with the standards of performance and conduct under paragraph (I) of rule 3745-300-04. The certified laboratory must display the original certificate in a prominent location on its premises.

Revocation or Suspension. This certificate is subject to suspension or revocation in accordance with OAC Chapter 3745-300. The authorization provided by this certificate ceases upon the effective date of the suspension or revocation.

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OhioEPA

Ohio Environmental Protection Agency
Division of Emergency and Remedial Response
Voluntary Action Program

Under the authority of Ohio Revised Code Section 3746.04(B)(6) and Ohio Administrative Code Rule 3745-300-04

Certifies

Severn Trent Laboratories - North Canton

4101 Shuffel Drive, NW
North Canton, OH 44720

as a

Certified Laboratory

(Number CL0024)

for the following analytes, parameter groups, and methods:

Total Petroleum Hydrocarbons Only, Gasoline Range Organics/8015A-Modified
N-Hexane/8260A-modified*, 8260B - modified*

*In accordance with all documentation submitted pursuant to OAC Rule 3745-300-04(O) and approved by the VAP.

JUN 0 8 2000
Date of Certification

Director, Ohio Environmental Protection Agency

JAN 2 9 2001
Date of Expiration

Manager, Voluntary Action Program

SCOPE, LIMITATION, OBLIGATIONS AND RESPONSIBILITIES OF CERTIFICATION ON REVERSE SIDE (Certificate 2 of 2)

Scope. This certificate applies only to the Ohio EPA Voluntary Action Program. The certified laboratory identified herein is authorized to perform analyses in support of no further action letters for the analytes, parameter groups, and methods which are identified on the face of this certificate, so long as this certificate remains effective. The laboratory is prohibited from performing any analyses in support of a no further action letter for any analyte or parameter group, or using any method that is not identified in this certificate. This certificates hereby modifies and supersedes any other Voluntary Action Program certificate issued to the laboratory prior to the date of this certificate. For parameter groups, this certificate authorizes analysis of only those compounds listed in the methods identified herein. This certificate does not authorize analysis of compounds which may meet a general criteria or description provided for in such methods, but are not listed.

Limitation. This certificate does not apply to any other Ohio EPA program nor does it serve any purpose other than that described in the "Scope" section. This certificate is subject to renewal under OAC rule 3745-300-04.

Obligations and Responsibilities. As a condition of certification, the certified laboratory accepts all obligations and responsibilities of a certified laboratory in the Voluntary Action Program, as set forth in ORC Chapter 3746 and OAC Chapter 3745-300, including but not limited to compliance with the standards of performance and conduct under paragraph (I) of rule 3745-300-04. The certified laboratory must display the original certificate in a prominent location on its premises.

Revocation or Suspension. This certificate is subject to suspension or revocation in accordance with OAC Chapter 3745-300. The authorization provided by this certificate ceases upon the effective date of the suspension or revocation.

This certificate is the property of Ohio EPA and must be surrendered to Ohio EPA upon the expiration, revocation, or suspension of the laboratory's certification.

OhioEPA

Ohio Environmental Protection Agency
Division of Emergency and Remedial Response
Voluntary Action Program

Under the authority of Ohio Revised Code Section 3746.04(B)(6) and Ohio Administrative Code Rule 3745-300-04

Certifies

Severn Trent Laboratories - North Canton

4101 Shuffel Drive, NW
North Canton, OH 44720

as a

Certified Laboratory

(Number CL0024)

for the following analytes, parameter groups, and methods:

Aluminum/6010B	Cobalt/6010B	Silver/6010B	Total Phenolics/9065*,420.1*	Chlorinated Herbicides/8151A
Antimony/6010B	Copper/6010B	Sodium/6010B	Chloride/9251*,300.0	Organochlorine Pesticides/8081A
Arsenic/6010B	Cyanide/335.2 (CLP-M)	Thallium/6010B,7841	Phosphate/365.2*,300.0	Polychlorinated Biphenyls/8082
Barium/6010B	Iron/6010B	Vanadium/6010B	Fluoride/300.0	Polynuclear Aromatic Hydrocarbons/610*
Beryllium/6010B	Lead/6010B	Zinc/6010B	Sulfate/300.0	Semi-Volatile Organic Compounds/8270C
Cadmium/6010B	Manganese/6010B	Selenium/6010B	Nitrate/300.0	Total Petroleum Hydrocarbons, Diesel Range Organics/418.1
Calcium/6010B	Mercury/7470A,7471A	Potassium/6010B	Bromide/300.0	Total petroleum Hydrocarbons Only, Diesel Range Organics/8015B
Chromium/6010B	Nickel/6010B	Chromium,Hexavalent/7196A		Volatile Organic Compounds/602*,8260B, 8260A

*Water Only

JUN 08 2000
Date of Certification

Christopher Jones
Director, Ohio Environmental Protection Agency

JAN 29 2001
Date of Expiration

Manager, Voluntary Action Program

SCOPE, LIMITATION, OBLIGATIONS AND RESPONSIBILITIES OF CERTIFICATION ON REVERSE SIDE (Certificate 1 of 2)

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OHIO E.P.A.

... 22 2000

ENTERED DIRECTOR'S JOURNAL

OhioEPA

Ohio Environmental Protection Agency
Division of Emergency and Remedial Response
Voluntary Action Program

Under the authority of Ohio Revised Code Section 3746.04(B)(6) and Ohio Administrative Code Rule 3745-300-04

Certifies

Quanterra Incorporated

4101 Shuffel Drive, NW
North Canton, OH 44720

as a

Certified Laboratory

(Number CL0024)

for the following analytes, parameter groups, and methods:

Aluminum/6010B	Cobalt/6010B	Silver/6010B	Total Phenolics/9065*,420.1*	Chlorinated Herbicides/8151A
Antimony/6010B	Copper/6010B	Sodium/6010B	Chloride/9251*,300.0	Organochlorine Pesticides/8081A
Arsenic/6010B	Cyanide/335.2 (CLP-M)	Thallium/6010B,7841	Phosphate/365.2*,300.0	Polychlorinated Biphenyls/8082
Barium/6010B	Iron/6010B	Vanadium/6010B	Fluoride/300.0	Polynuclear Aromatic Hydrocarbons/610*
Beryllium/6010B	Lead/6010B	Zinc/6010B	Sulfate/300.0	Semi-Volatile Organic Compounds/8270C
Cadmium/6010B	Manganese/6010B	Selenium/6010B	Nitrate/300.0	Total Petroleum Hydrocarbons, Diesel Range Organics/418.1
Calcium/6010B	Mercury/7470A,7471A	Potassium/6010B	Bromide/300.0	Total petroleum Hydrocarbons Only, Diesel Range Organics/8015B
Chromium/6010B	Nickel/6010B	Chromium,Hexavalent/7196A		Volatile Organic Compounds/602*,8260B, 8260A

*Water Only

MAR 22 2000
Date of Certification

JAN 29 2001
Date of Expiration

Christopher Jones

Director, Ohio Environmental Protection Agency

Manager, Voluntary Action Program

SCOPE, LIMITATION, OBLIGATIONS AND RESPONSIBILITIES OF CERTIFICATION ON REVERSE SIDE (Certificate 1 of 2)

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Ohio EPA

Ohio Environmental Protection Agency
Division of Emergency and Remedial Response
Voluntary Action Program

Under the authority of Ohio Revised Code Section 3746.04(B)(6) and Ohio Administrative Code Rule 3745-300-04

Certifies

Quanterra Incorporated

4101 Shuffel Drive, NW
North Canton, OH 44720

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(Number CL0024)

for the following analytes, parameter groups, and methods:

Total Petroleum Hydrocarbons Only, Gasoline Range Organics/8015A-Modified
N-Hexane/8260A-modified*, 8260B - modified*

*In accordance with all documentation submitted pursuant to OAC Rule 3745-300-04(O) and approved by the VAP.

MAR 22 2000
Date of Certification

Director, Ohio Environmental Protection Agency

JAN 29 2001
Date of Expiration

Manager, Voluntary Action Program

SCOPE, LIMITATION, OBLIGATIONS AND RESPONSIBILITIES OF CERTIFICATION ON REVERSE SIDE (Certificate 2 of 2)

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OHIO EPA
ENTERED
DIRECTOR'S JOURNAL
JAN 2 9 1999

ATTACH[illegible]T I

Ohio EPA

Ohio Environmental Protection Agency
Division of Emergency and Remedial Response
Voluntary Action Program

Under the authority of Ohio Revised Code Section 3746.04(B)(6) and Ohio Administrative Code Rule 3745-300-04

Certifies

Quanterra Incorporated

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as a

Certified Laboratory

(Number CL0024)

for the following analytes, parameter groups, and methods:

Aluminum/6010B	Cobalt/6010B	Silver/6010B	Total Phenolics/9065*,420.1*	Chlorinated Herbicides/8151A
Antimony/6010B,7041	Copper/6010B	Sodium/6010B	Chloride/9251*,300.0	Organochlorine Pesticides/8081A
Arsenic/6010B, 7060A	Cyanide/335.2 (CLP-M)	Thallium/6010B,7841	Phosphate/365.2*,300.0	Polychlorinated Biphenyls/8082
Barium/6010B	Iron/6010B	Vanadium/6010B	Phosphorus/365.2*	Polynuclear Aromatic Hydrocarbons/610*,8100,8310
Beryllium/6010B	Lead/6010B,7421	Zinc/6010B	Bromide/300.0	Semi-Volatile Organic Compounds/8270C
Cadmium/6010B,7131A	Manganese/6010B	Selenium/6010B,7740	Fluoride/300.0	Total Petroleum Hydrocarbons, Diesel Range Organics/418.1
Calcium/6010B	Mercury/7470A,7471A	Potassium/6010B	Nitrate/300.0	Total Petroleum Hydrocarbons Only, Diesel Range Organics/8015B
Chromium/6010B	Nickel/6010B	Chromium,Hexavalent/7196A	Sulfate/300.0	Volatile Organic Compounds/602*,8021B,8260B

*Water Only

JAN 2 9 1999
Date of Certification

JAN 2 9 200[illegible]
Date of Expiration

Director, Ohio Environmental Protection Agency

Manager, Voluntary Action Program

SCOPE, LIMITATION, OBLIGATIONS AND RESPONSIBILITIES OF CERTIFICATION ON REVERSE SIDE (Certificate 1of2)

OHIO EPA
ENTERED
DIRECTOR'S JOURNAL
JAN 29 1999

Scope. This certificate applies only to the Ohio EPA Voluntary Action Program. The certified laboratory identified herein is authorized to perform analyses in support of no further action letters for the analytes, parameter groups, and methods which are identified in this certificate, so long as this certificate remains effective. The laboratory is prohibited from performing any analyses in support of a no further action letter for any analyte or parameter group, or using any method that is not identified in this certificate. This certificates hereby modifies and supersedes any other Voluntary Action Program certificate issued to the laboratory prior to the date of this certificate. For parameter groups, this certificate authorizes analysis of only those compounds listed in the methods identified herein. This certificate does not authorize analysis of compounds which may meet a general criteria or description provided for in such methods, but are not listed.

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ATTACHMENT I

OhioEPA

Ohio Environmental Protection Agency
Division of Emergency and Remedial Response
Voluntary Action Program

Under the authority of Ohio Revised Code Section 3746.04(B)(6) and Ohio Administrative Code Rule 3745-300-04

Certifies

Quanterra Incorporated

4101 Shuffel Drive, NW
North Canton, OH 44720

as a

Certified Laboratory

(Number CL0024)

for the following analytes, parameter groups, and methods:

Total Petroleum Hydrocarbons only, Gasoline Range Organics/8015A-Modified

JAN 29 1999

JAN 29 1999
Date of Certification

Director, Ohio Environmental Protection Agency

JAN 29 2001
Date of Expiration

Manager, Voluntary Action Program

SCOPE, LIMITATION, OBLIGATIONS AND RESPONSIBILITIES OF CERTIFICATION ON REVERSE SIDE (Certificate 2 of 2)

Ohio EPA

Ohio Environmental Protection Agency
Division of Emergency and Remedial Response
Voluntary Action Program

Under the authority of Ohio Revised Code Section 3746.04(B)(6) and Ohio Administrative Code Rule 3745-300-04

Certifies

QUANTERRA INCORPORATED

4101 Shuffel Drive, NW
North Canton, OH 44720

as a

Certified Laboratory

(Number CL0024)

for the following **ADDITIONAL** analytes, parameter groups, and methods:

Thallium/7841

OHIO E.P.A.
OCT 24 97
ENTERED DIRECTOR'S JOURNAL

10/24/97	01/31/99
Date of Certification	**Date of Expiration**
Donald R. Schregardus	
Director, Ohio Environmental Protection Agency	**Manager, Voluntary Action Program**

SCOPE, LIMITATION, OBLIGATIONS AND RESPONSIBILITIES OF CERTIFICATION ON REVERSE SIDE

OhioEPA

Ohio Environmental Protection Agency
Division of Emergency and Remedial Response
Voluntary Action Program

ENTERED DIRECTOR'S JOURNAL
JAN 31 97
OHIO E.P.A.

Under the authority of Ohio Revised Code Section 3746.04(B)(6) and Ohio Administrative Code Rule 3745-300-04

Certifies

Quanterra Incorporated

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North Canton, OH 44720

as a

Certified Laboratory

(Number CL0024)

for the following analytes, parameter groups, and methods:

Aluminum/6010A	Calcium/6010A	Magnesium/6010A	Sulfate/300.0	Selenium/6010A,7740	Volatile Organic Compounds/~~8240B,~~8260A,8010B,8020A,8021,602
Antimony/6010A, 7041	Chromium/6010A	Manganese/6010A	Silver/6010A	Chloride/~~9252A~~,9251,300.0	Semi-Volatile Organic Compounds/8270B
Arsenic/6010A, 7060A	Cobalt/6010A	Mercury/7470A,7471A	Sodium/6010A	Chromium,Hexavalent/7196A	Organochlorine Pesticides/8080A
Barium/6010A	Copper/6010A	Molybdenum/6010A	Strontium/6010A	Fluoride/300.0	Polychlorinated Biphenyl/8080A
Beryllium/6010A	Cyanide/9012	Nickel/6010A	Thallium/6010A	Potassium/6010A	Polynuclear Aromatic Hydrocarbons/8310,8100,610
Bromide/300.0	Iron/6010A	Phosphate/365.2,300.0	Vanadium/6010A	Total Phenolics/9065,420.1	Total Petroleum Hydrocarbons/418.1, Modified 8015A
Cadmium/6010A,7131	Lead/6010A,7421	Phosphorus/365.2	Zinc/6010A	Nitrate/300.0	Chlorinated Herbicides/8151,~~8150~~
					Organophosphorus Pesticides/8141A

JAN 31 1997
Date of Certification

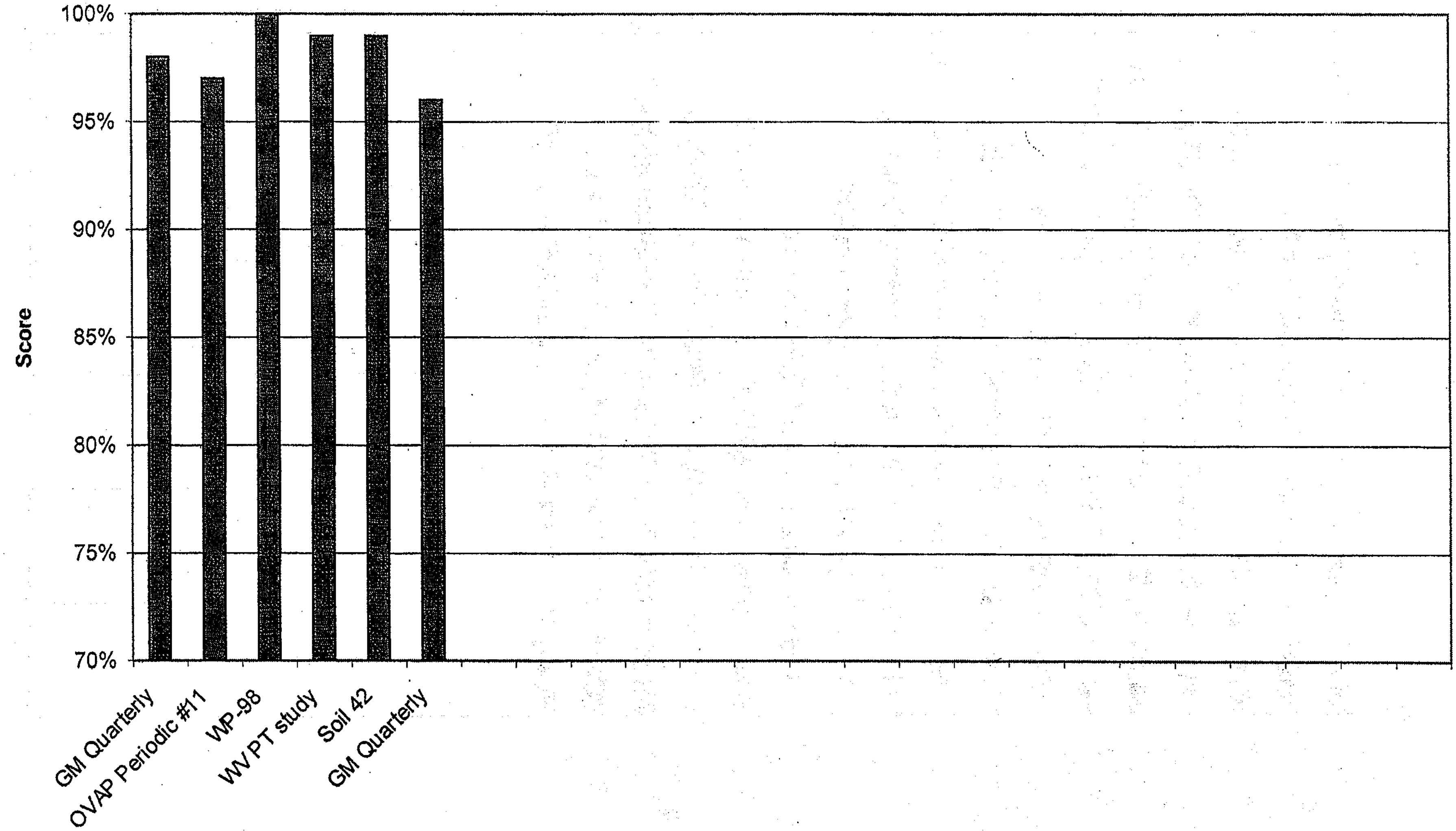
Donald R. Schregardus
Director, Ohio Environmental Protection Agency

JAN 31 1999
Date of Expiration

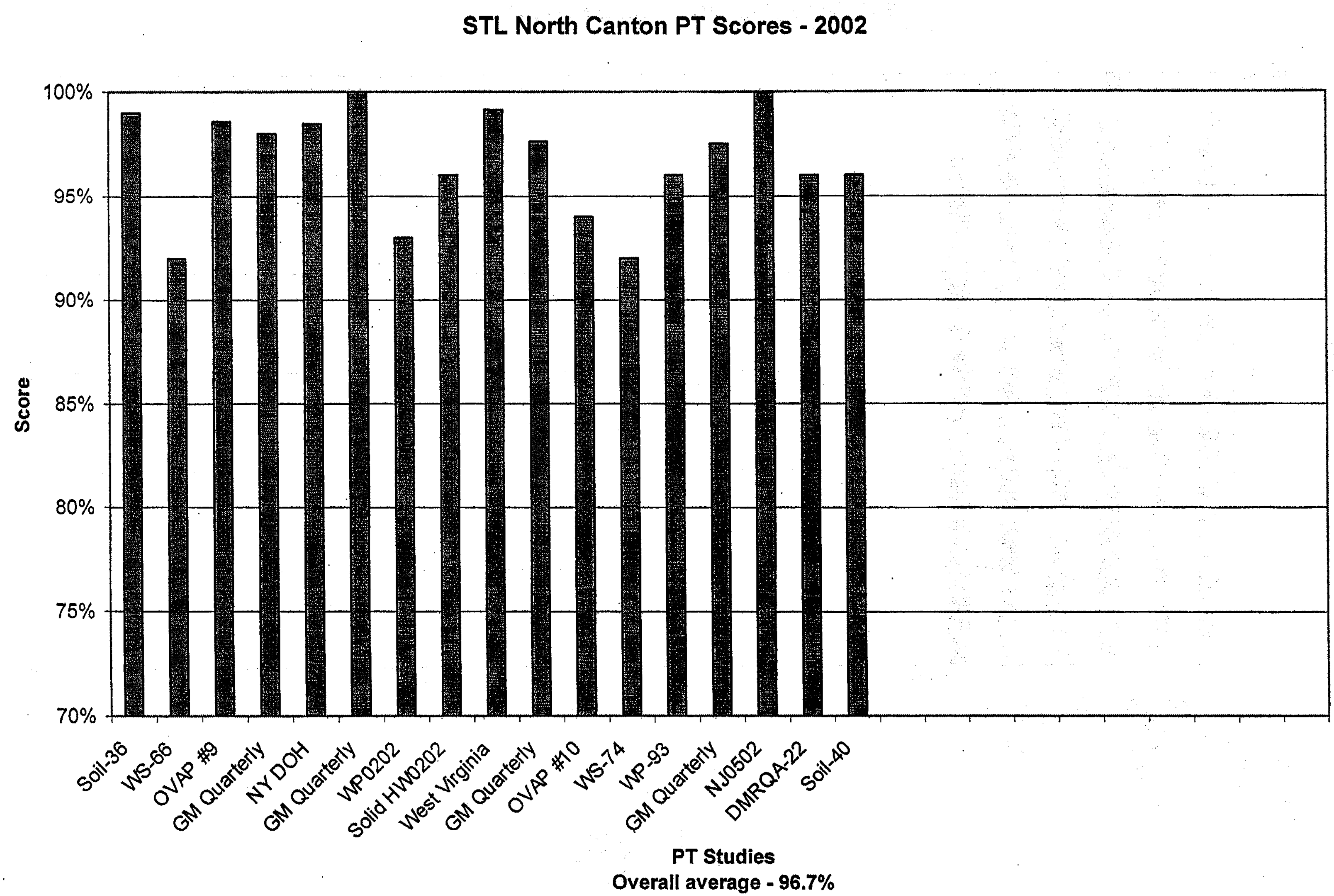
Manager, Voluntary Action Program

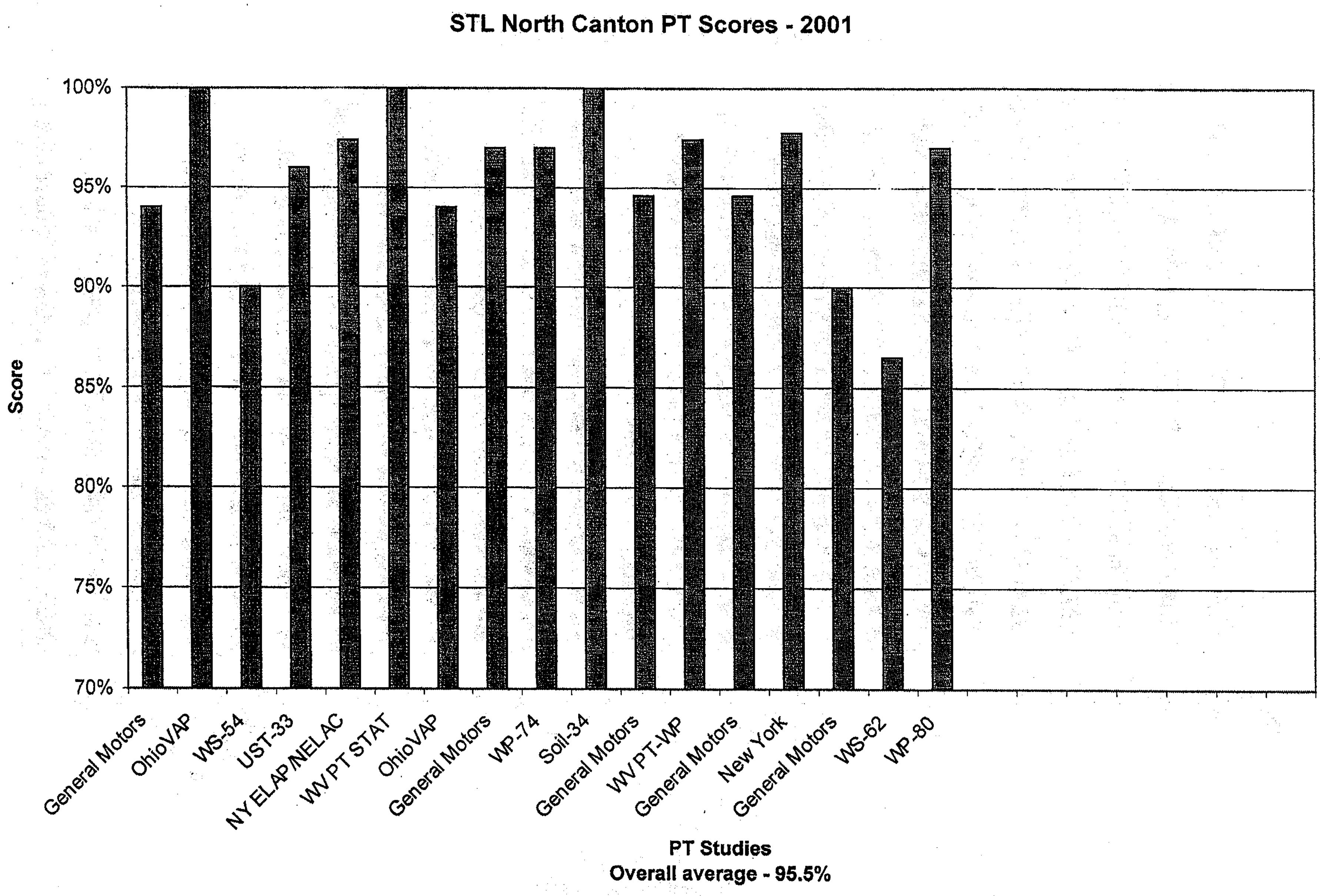
SCOPE, LIMITATION, OBLIGATIONS AND RESPONSIBILITIES OF CERTIFICATION ON REVERSE SIDE

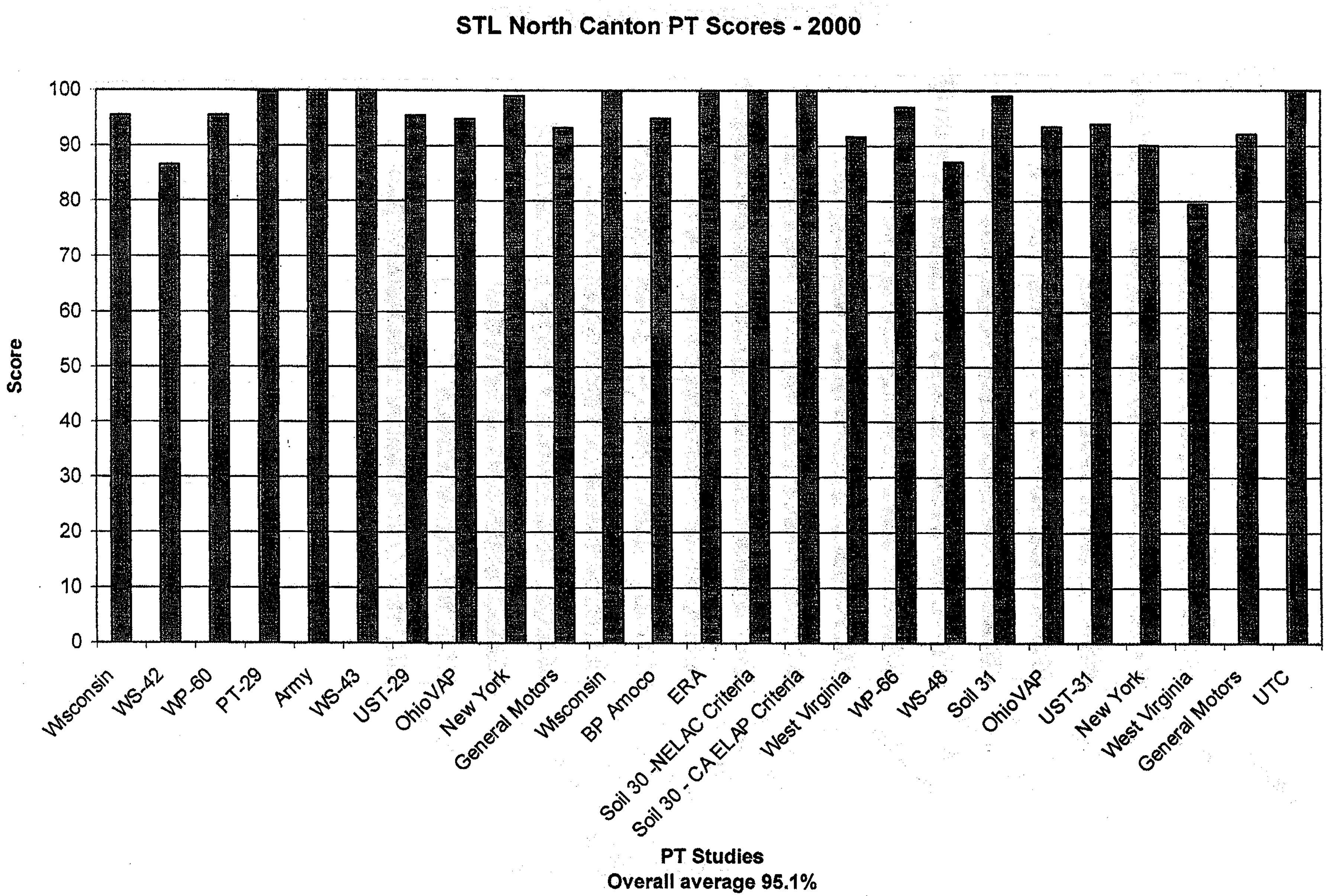
STL North Canton PT Scores - 2003



PT Studies
Average - YTD - 98.8%


STL North Canton PT Scores - 2002
Score
100%
95%
90%
85%
80%
75%
70%
Soil-36
WS-66
OVAP #9
GM Quarterly
NY DOH
GM Quarterly
WP0202
Solid HW0202
West Virginia
GM Quarterly
OVAP #10
WS-74
WP-93
GM Quarterly
NJ0502
DMRQA-22
Soil-40
PT Studies
Overall average - 96.7%


STL North Canton PT Scores - 2001
Score
100%
95%
90%
85%
80%
75%
70%
General Motors
OhioVAP
WS-54
UST-33
NY ELAP/NELAC
WV PT STAT
OhioVAP
General Motors
WP-74
Soil-34
General Motors
WV PT-WP
General Motors
New York
General Motors
WS-62
WP-80
PT Studies
Overall average - 95.5%


STL North Canton PT Scores - 2000
Score
100
90
80
70
60
50
40
30
20
10
0
Wisconsin
WS-42
WP-60
PT-29
Army
WS-43
UST-29
OhioVAP
New York
General Motors
Wisconsin
BP Amoco
ERA
Soil 30 -NELAC Criteria
Soil 30 - CA ELAP Criteria
West Virginia
WP-66
WS-48
Soil 31
OhioVAP
UST-31
New York
West Virginia
General Motors
UTC
PT Studies
Overall average 95.1%

Quanterra North iton's 1999
Performance Evluation Samples

Agency	Date Analyzed**	Type	Score
ASI	09/98	Double Blind	96.5%
ERA	01/99	WS-030	81.4%
Wisconsin	02/99	1999-1	100%
ERA	05/99	WP-048	95.3%
Army	03/99	Navy PE's	*PASS
ERA	03/99	UST	80.0%
New York	02/99	DOH/CLP	89.2%
APG	04/99	Ohio VAP	86%
ERA	05/99	WP-51	80%
Region V	07/99	Client – Gary Works	98.9%
Allied Signal	06/99	Client – Round Robin	47.6%
ERA	07/99	UST	100%
APG-PETs	07/99	West Virginia	93%
APG	09/99	West Virginia	96.7%
ERA	09/99	North Carolina	96.3%
ERA	08/99	WP-54	94.9%
ERA	08/99	WS-36	92.7%
New York	08/99	DOH & CLP	97.8%
ERA	11/99	UST	95%
APG	10/99	North Carolina	96.3%
APG	11/99	West Virginia Make-up	96.7%
APG	09/99	OhioVAP	98.4%
Average for 1999			***91.9%***

* *Pass or Fail score only*
** *PE scores listed in order of results received by laboratory*

Last Updated 12/10/99

N:\QAQC\PESCORES\DOCS\PE Score Summary\SUM_99.doc

Quanterra North Canton's 1998
Performance Evluation Samples

Agency	Type	Score
APG	Drinking Water (Inorganics Only)	84.7%
Ohio	VAP	81.9%
Wisconsin	1998-1	91.2%
ARMY	MRD	Passed*
Water Supply	WS-040	87.5%
Ultra Scientific	Misc	100%
New York	DOH	94.5%
Water Pollution	WP-039	94.8%
Wisconsin	1998-2	95.2%
West Virginia	APG	93.2%
Ohio	VAP	90.0%
Average for 1997		***91.3%***

* *Pass or Fail score only*

Quanterra North _anton's 1997
Performance Evluation Samples

Agency	Type	Score
APG	OH-VAP (BNA only)	93.8%
APG	OH-VAP (Ion Chrom.)	100%
APG	OH-VAP (Phenol make-up)	100%
Wisconsin	1997-1, Environmental Reference	94%
NSI	TCLP	100%
Contech	Navy - CLP	98.9%
WS-038	Water Supply	71.8%
APG	Drinking Water	95.8%
California	Hazardous Waste	96.6%
WP-037*	Water Pollution	79%
New York	DOH & CLP	93.6%
APG	West Virginia	97.3%
APG	Drinking Water	82%
ASI - QES	Double Blind	95.9%
WS-039	Water Supply	79.2%
New York	DOH & CLP	96.1%
APG	Drinking Water	83.3%
Wisconsin	1997-3 (make-up)	100%
California	Hazardous Waste	100%
WP-038	Water Pollution	95%
Average for 1997		***92.6%***

Mark J. Loeb
Quality Assurance Scientist

Quanterra Incorporated
4101 Shuffel Drive, NW
North Canton, Ohio 44720

330 497-9396 Telephone
330 497-0772 Fax

Quanterra
Environmental Services

January 20, 1997

Darlene L. Stanley
Environmental Specialist; Ohio EPA
1800 WaterMark Drive
Columbus, OH 43215-1099

Dear Ms. Stanley:

Quanterra North Canton offers the following response to the Ohio Environmental Protection Agency's letter dated January 8, 1997. These comments pertain to Section 1: Quanterra Incorporated Quality Assurance Management Plan (QAMP), Section 2: Standard Operating Procedures (SOPs) submitted to apply for laboratory certification under rule 3745-300-04 of the Administrative Code and Section 3: Additional Parameters.

Section 1: Quality Assurance Management Plan

Comment:

#1 Section 5.6 or Appendix C. Incorporate into text a statement indicating that all documents prepared or acquired in connection with a Voluntary Action will be retained for a period of ten years from the date the analyses were submitted to a certified professional. Please refer to paragraph (B)(2) of rule 3745-300-04 of the administrative code which describes document retention.

Response:
Quanterra North Canton will retain all documents prepared or acquired in connection with a Voluntary Action for a period of ten years from the time analyses are submitted to a certified professional. Please see Attachment 10.

#2 Appendix C. Include discussion on the elements that are included in an internal system audit or attach an example of an audit form.

Response:
Attachment 1 is a copy of the Quanterra 1996 Quality Systems Audit Checklist as referred to by Appendix C of the QAMP.

Section 2: Standard Operating Procedures

Comment:

#1 The Ohio EPA requires that each laboratory establish internal quality control (QC) limits for all QC samples (i.e., matrix spikes, surrogates, and check samples) and comply with procedures contained in Solid Waste 846.

Quanterra
Environmental Services

Response:
Quanterra does not routinely include laboratory established internal QC limits in SOP documents due to the frequency with which they may be updated. Attachment 2 is a list of the current QC limits for the North Canton Facility. These limits are the current limits as of the date of this letter and may change at anytime upon review and update.

#2 The application indicates that Quanterra is applying for certification for methods 8100 and 610. Please submit these SOPs and the extraction SOPs for Total Petroleum Hydrocarbons. Review all SOPs (especially 1994 and 1995 SOPs) to ensure the accuracy of the cross-referencing to other SOPs. Many SOPs were revised to include a corporate numbering system.

Response:
The SOPs for methods 8100 and 610 are in the final edit stages and will be complete by January 22, 1997. Copies of these documents will be forwarded as soon as they are complete. A review of all SOPs submitted is an ongoing process. As SOPs change and are updated, all references are verified to ensure accuracy.

Method 8270 - CORP-MS-0001

#3, #5 Section 10.4.7. Review SW-846 method 8270B and revise calibration criteria (i.e., 80% criteria). All analytes must meet the 15% criterion to use the average response factor, or the first or higher order regression curve may be used if any analyte exceeds the 15% criterion.

Response:
Sections 10.4.7., 12.5.3., 17.1.6, and 17.2.4. are in this SOP for those Quanterra Facilities that have software limitations to using the first or higher order regression curve for quantitation. Quanterra North Canton has no such limitation and the requirements in method 8270 are followed. The requirements as followed by Quanterra North Canton are that all analytes must meet the 15% criterion to use the average response factor from the initial calibration. Those compounds that do not meet the 15% RSD criterion are quantitated using the linear curve, or alternatively a linear curve will be used for all compounds.

#4 Section 10.5.3. Include the criteria for the level 2 calibration standard in addition to the CCCs and SPCCs, or is the reference to the 20% criterion for the CCC inclusive of the level 2 calibration standard.

Response:
For all known Ohio Voluntary Action Program analyses, the level 2 standard will be run at a 20 % acceptance criteria for all compounds that have been identified as compounds of interest or target compounds for a specific project. Every effort will be made to ensure the 20 % criteria is meet. If Quanterra is unable to meet this acceptance criteria, the certified professional responsible for the project will be notified. Quanterra will generate a Non-conformance Memo (NCM) documenting any such anomalies and the reason the laboratory was unable to meet the requirement. Quanterra understands the importance of ensuring the data generated is of sound and legally defensible integrity.

Method 8240B and 8260A - CORP-MS-0002

#6 Sections 10.4.6, 17.1.8, and 17.1.9. Review SW-846 methods 8240B/8260A and revise calibration criteria. All analytes must meet the 15% criterion to use the average response factor, or the first or higher order regression curve may be used if any analyte exceeds the 15% criterion.

Response:
Sections 10.4.6, 17.1.8, and 17.1.9 are in this SOP for those Quanterra facilities that have software limitations to using the first or higher order regression curve for quantitation. Quanterra North Canton has no such software limitations and the requirements in methods 8240B and 8260A are followed so that all analytes must meet the 15% criterion to use the average response factor from the initial calibration. Those compounds that do not meet the 15% RSD criterion are quantitated using a linear curve or alternatively a linear curve will be used for all compounds. Attachment 4 is an Appendix to the corporate SOP which states the requirements as listed above are met at Quanterra North Canton.

#7 Section 10.5.3. Include the criteria for the level 3 calibration standard in addition to the CCCs and SPCCs, or is the reference to the 20% criterion for the CCC inclusive of the level 3 calibration standard. Does the 50% drift criterion apply only to analytes that are not required for a project?

Response:
For all known Ohio Voluntary Action Program analyses, the level 3 calibration standard will be run at a 20 % acceptance criteria for all compounds that have been identified as compounds of interest or target compounds for a specific project. Every effort will be made to ensure the 20 % criteria is meet. If Quanterra is unable to meet this acceptance criteria, the certified professional responsible for the project will be notified. Quanterra will generate a Non-conformance Memo (NCM) documenting any such anomalies and the reason the laboratory was unable to meet the requirement. Quanterra understands the importance of ensuring the data generated is of sound and legally defensible integrity.

#8 Section 12. Include in nonaqueous equations adjustments for percent moisture.

Response:
Included in this response as Attachment 3 is the SOP No. NC-WC-0004, Total Solids, Percent Moisture, ash and Total Volatile Solids. This SOP documents the procedures and the calculations used for adjusting sample results for percent moisture.

Method 8000A, 8010B, 8020A, 8021A, 8080A, 8081, 8150B - CORP-GC-0001 Method 8000A

#9 Section 9.0. Provide QC limits for each type of QC sample (i.e., matrix spikes, surrogates, check samples) in each method. A statement may be provided indicating that limits are subject to change.

Response:
See Attachment 2

#10 The Ohio EPA requires that all laboratories comply with the method blank criteria contained in SW-846. Revise accordingly.

Quanterra Environmental Services

Response:
Quanterra will comply with this requirement.

#11 Section 10.9.11. Review Method 8000A and applicable methods and revise criteria accordingly.

Response:
Quanterra is currently following the requirements as indicated in the SW-846 8000A for all reportable analytes. . In section 10.9.3 of the SOP No. Corp-GC-0001 states, "Any analyte that is reportable as found must have a % difference of ≤ 15 % in the preceding continuing calibration, on the column used for quantitation. For dual column analysis, the column used for quantitation will be the column with the lower result. Methods 8010B and 8020A have different continuing calibration limits that are obtained from Table 3 of the reference method and are listed in Appendix A of this SOP."

The indicated Section 10.9.11 from comment 11 refers to unreportable (Non-Detect) analytes. As allowed in section 7.6.8 of SW 846 8000A, the same lower criteria is used for acceptance of the continuing calibration. However the lab is currently allowing acceptance of the continuing calibration based on a 30 % upper range only for analytes which could not be quantitated. In this type of situation, the system is considered to be biased high and the validity of the lower reporting limit is not considered jeopardized.

#12 Section 11.6 provide estimated retention time windows for each compound in the appropriate appendix.

Response:
See Attachment 4

#13 Section 17.1.3. The Ohio EPA requires all laboratories to comply with the method blank criteria contained in SW846. Revise accordingly.

Response:
Quanterra will comply with this requirement.

Method 8310 - LM-WALN-6000

#14 Include tables listing concentrations and analytes used for matrix spikes, checks samples, and surrogates as were provided in the gas chromatography method.

Response:

Analyte	Spike Concentration	Analyte	Spike Concentration
Naphthalene	20.0 ug/L	Pyrene	2.00
Acenaphthylene	40.0 ug/L	Benzo(a)anthracene	2.00
Acenaphthene	20.0 ug.L	Benzo(b)fluoranthene	4.00
Fluorene	4.00 ug/L	Benzo(k)fluoranthene	2.00
Phenanthrene	2.00 ug./L	Benzo(a)pyrene	2.00
Anthracene	2.00 ug/L	Dibenz(a,h)anthracene	4.00
Chrysene	2.00 ug/L	Benzo(g,h,i)perylene	4.00
Fluoranthene	4.00 ug/L	Indeno(1,2,3-cd)pyrene	2.00

Quanterra Environmental Services

#15 Section 11.5. Provide the equation for precision.

Response:
The calculation used for precision is:

$$\frac{X_1 - X_2}{\frac{(X_1 + X_2)}{2}}$$

Where: X_1 = first observed concentration
X_2 = second observed observation

#16 Sections 11.5 and 11.6. Provide quality control (QC) limits (i.e., accuracy and precision) for each type of QC sample (i.e., matrix spikes, surrogates, check samples). A statement may be provided indicating that limits are subject to change.

Response:
See Attachment 2.

#17 Section 15. Provide estimated retention time window for each analyte.

Response:
See Attachment 4.

#18 Section 16.1. Include in nonaqueous equation the adjustment for percent moisture.

Response:
See Attachment 3, SOP No. NC-WC-0004, <u>Total Solids, Percent Moisture, Ash and Total Volatile Solids</u>.

Total Petroleum Hydrocarbons - NC-GC-0013 The Generic Soil Standard Rule includes petroleum fractions up to c-32.

#19 Section 1.4. Please clarify whether this SOP applies to 8015-modified.

Response:
NC-GC-0013 applies to 8015 modified.

#20 Section 9.0. Provide quality control (QC) limits (i.e., accuracy and precision) for each type of QC sample (i.e., matrix spikes, surrogates, check samples). A statement may be provided indicating that limits are subject to change.

Response:
See Attachment 2.

#21 Section 9.4.3.1. Please clarify if an internal standard is used in this SOP. If so, Provide the chemical name and criterion.

Response:
At this time, no internal standard is used.

#22 Section 10.3.4. Please clarify the meaning of the second sentence in this paragraph.

Response
"10.3.4. Every compound of interest will be verified within twenty-four hours of sample analysis. The compounds will be dispersed within the analytical sequence after every ten samples." The statement is meant to clarify the method of fingerprinting a particular petroleum hydrocarbon (i.e., Mineral Spirits, Kerosene, Fuel Oil #2, etc.) found in a sample. If a sample has been analyzed and a fingerprint of the type of Petroleum Hydrocarbon is requested, a standard containing the hydrocarbon will be run within a 24 hour period to verify the pattern is the same as or very similar to the pattern generated by the sample.

#23 Section 12. Include in the equation adjustment for percent moisture for soils/sediments. Revise equation to include dilution factor.

Response:
See Attachment 3, SOP No. NC-WC-0004, Total Solids, Percent Moisture, Ash and Total Volatile Solids.

Method 602 - NC-GC-0003 - General Comment this SOP is vague and requires more detail as was provided in SW-846 methods. Revise this method accordingly.

Response:
This SOP is currently under revision and will be provided as soon as possible. Detail, although similar, is not the same as the CORP-GC-0001 SOP which includes method SW-846 8020. Responses to comments below will be included in the SOP revision.

#24 Section 9.0. Provide QC limits (i.e., accuracy and precision) for each type of QC sample (i.e., matrix spikes, surrogates, check samples). A statement may be provided indicating that limits are subject to change. Include analytes and associated concentrations used for spiking of surrogates, matrix spikes, and check samples. Include information on internal standards.

Response:
See Attachment 2 for control limits. Internal Standards used are Fluorobenzene and Chlorofluorobenzene at a 50 ng concentration.

#25 Section 10.2 include calibration range(s)

Response:
The Calibration range for Method 602 is 5ng - 200 ng.

#26 Section 10.2.3. Include amounts and concentrations of internal standard and surrogates added to each sample.

Quanterra
Environmental Services

Response:
The concentration for internal standards and surrogates used in this method are all 50 ng.

#27 Section 10.3. Include calibration criteria.

Response:
The calibration criteria used for Method 602 is the same as Table A-10 from SOP No. Corp-GC-0001. A copy is provided for your convenience as Attachment 5 of this document.

#28 Section 12.0. Provide information on qualitative analysis. Include estimated retention time windows for each analyte and all equations used for quantitative analyses including precision and accuracy equations.

Response:
Estimated retention time windows have been included in Attachment 4 of this document. The requested equations used for quantitative analyses will be included in the updated SOP currently under revision. These equations are the same as those found in SOP No. Corp-GC-0001.

#29 Table 1. Include reporting limits for sludges/soils.

Response:
Method 602 was designed for analysis of water/wastewater matrices. If Quanterra North Canton is required to report results for sludges/soils under method 602, reporting limits for these matrices will be the same as SW-846 8020 as found in SOP No. Corp-GC-0001.

Method 8141 - LM-WALN-4081

#30 Review comments for method 602 and ensure that each item(s) is addressed in this SOP, where applicable.

Response:
This SOP is currently under revision to include all applicable items as indicated by your comments for Method 602.

#31 Sections 12.4.3 and 12.4.5. The 15 % criteria must be applied for any compound quantitated and reported from either column. The 25% criteria may apply only if the compound(s) is not quantitated and reported to the client from that column. Sections 12.4.3. through 12.4.5 are confusing as written. Recommend revising language for clarity.

Response:
See response to comment #30. This criteria will be addressed in the revised SOP.

#32 Section 13.3. Compare the procedures listed in this section with those provided in SW-846 method 8141A. Revise accordingly. Clarify how the 25% criteria discussed in section 13.3.3. was derived by the laboratory.

Response:
See response to comment #30. This criteria will be addressed in the revised SOP.

#33 Section 167. Include adjustment for percent moisture in all equations, where applicable.

Response:
See Attachment 3, SOP No. NC-WC-0004, Total Solids, Percent Moisture, Ash and Total Volatile Solids.

Method 418.1 NC-WC-0048

#34 Section 9.4. Is a liter sample split into three or are triplicate samples collected for MS/MSD?

Response:
Two (2) liters of sample are required at a minimum to perform an MS/MSD. One (1) liter of sample will be used for actual sample analysis. The second liter would be split for the MS and MSD analysis. If there are no samples included in a batch that contain this minimum sample amount, then Quanterra will perform a Laboratory Control Sample (fortified blank) and a Duplicate Control Sample (LCS/DCS) to demonstrate precision of the analysis.

#35 Include Calibration procedures, sample analysis and the method used to obtain the final results.

Response:
This information is included in the analytical SOP No. LM-WALN-1223 that should have been included in the initial application. A copy of this SOP is included under Attachment 6 of this document.

Method 365.2 NC-WC-0050 - Phosphorus

#36 Section 9.4. In spiking a sample, the volume of the spike solution to be added must not exceed 5% of the sample volume.

Response:
SOP No. NC-WC-0050 will be revised to include this criteria. 1.0 ml of a 50 ppm spike will be added to 50 ml of sample. The final volume of sample will then be brought to a 100 ml volume resulting in a 0.5 ppm spike concentration.

Method 9252 NC-WC-0013 - Chloride - Automated

#37 Section 9.3. The laboratory Control Sample must be analyzed every 15 samples.

Response:
The SOP will be revised to include this criteria.

#38 Section 9.4. In spiking a sample, the volume of the spike solution to be added must not exceed 5% of the sample volume. Also, one spike duplicate sample must be analyzed every 10 samples.

Quanterra Environmental Services

Response:
The SOP will be revised to reflect this requirement. 0.1 mL of a 1000ppm spike will be added to a 4 ml sample achieving a final spike concentration of 25 ppm. The batch definition for this analysis has been changed to meet the requirement of a 15 sample size. In addition to the LCS, an MS/MSD set will be included in the Batch of 15 samples to meet the requirements for both accuracy verification and precision verification.

Method 9012 NC-WC-0031 - Cyanide - Automated

#39 At least two calibration standards, with similar values on the calibration curves, must be distilled with the samples. This is to ensure that the distillation technique is reliable. These results of the distilled standards must agree within ± 10% of the undistilled samples.

Response:
For all known Ohio Voluntary Action Program analyses, the two (2) calibration standards will be distilled and analyzed. The laboratory will use an acceptance criteria of ± 10%. Every effort will be made to ensure the 10 % criteria is meet. If Quanterra is unable to meet this acceptance criteria, the certified professional responsible for the project will be notified. Quanterra will generate a Non-conformance Memo (NCM) documenting any such anomaly and the reason the laboratory was unable to meet the requirement. Quanterra understands the importance of ensuring the data generated is of sound and legally defensible integrity.

#40 Sections 9.3 and 9.4. Verify the frequency at which the LCS and MS/MSD are being analyzed with what is stated in SW-846.

Response:
The SOP will be revised to reflect a batch of 15 samples, 1 LCS and 1 MS/MSD set per batch.

Method 7470A/7471A - CORP-MT-0004/0007 - Mercury

#41 Section 6.0. List the name of the instrument being used.

Response:
The Leeman PS200 is used for this analysis.

#42 Section 11. List the procedure used for operating the instrument for automated determination.

Response:
The laboratory is currently manually digesting samples in a hot water bath and using the Leeman PS200 for the automated analysis. This procedures used are detailed in the SOP No. CORP-MT- 0004 and . SOP No. CORP-MT- 0007.

Quanterra Environmental Services

Method Graphite Furnace - Corp-MT-0003

#43 Section 6.0. List the brand name and model number for the graphite furnace.

Response:
Quanterra currently is using the Varian SpectrAA-400 for all graphite furnace analyses.

#44 Section 7.8. Is palladium used as the matrix modifier for each element? Specify the matrix modifiers for each element.

Response:
Palladium is not the only matrix modifier used.. Currently, Quanterra is using the following matrix modifiers for each element:

Arsenic	2000 ppm $NiNO_3$
Selenium	1000 ppm Palladium/ 2 % Citric Acid/2% NH_4NO_3
Lead	1.5% H_3PO_4
Cadmium	1% $NH_4H_2PO_4$
Antimony	1000 ppm Palladium / 2 g Citric acid/100 mL

#45 Provide the operating instructions for each instrument.

Response:
Quanterra is unsure what is needed by the State to respond to this issue. Each instrument has an Instrument Operation Manual which is copywrited by the manufacturer and cannot be supplied. At this time, Quanterra can supply a brief outline of instrument operation for Graphite Furnace analysis as follows:

Graphite Furnace Instrument Operation

- Turn on instrument and allow to warm up
- Call up appropriate program and allow specific lamp to warm up for appx 15 minutes.
- Prepare and pour calibration and continuing calibration stds in appropriate autosampler cups
- Enter Sample IDs into instrument and load samples in the same order as entered.
- Start program
- After instrument run is complete, verify that all required QC criteria is met by a level I and level II review.

#46 Provide the actual MDL for each element.

Response:
See Attachment 7.

Method Graphite Furnace Prep. NC-IP-0007

#47 Section 11.3. Is there any special circumstances for the digestion of silver? Describe how one would know that the digestion is complete. Verify the volume ratio of acid to sample with what is stated in SW 846

Quanterra Environmental Services

Response:
Digestion is complete when the sample is light in color or does not change in appearance . The sample is heated until volume is reduced to 15 - 20 mL Quanterra North Canton is using Method 3005A for metals sample digestion. The method allows for the addition of 6 mL Concentrated HNO_3 / 100mL of sample. Quanterra adds 3 mL Concentrated HNO_3 / 50 mL of sample. The method also says to add 10 mL 1:1 HCl per 100 mL of sample. Quanterra adds 5 mL 1:1 HCl / 50 mL of sample. Using these ratios, the volumes of acids used correspond to the volumes requested in the method.

Method ICP & Flame AA Prep - NC-IP-0003

#48 Section 11.3 &11.4. Verify the volume ratio of acid to sample with what is stated in SW 846

Response:
See response to comment #47.

Method Digestion of sediment, etc, NC-IP-0004

#49 Section 6. A drying oven was not mentioned. How is percent moisture calculated for dry weight results?

Response:
See Attachment 3, SOP No. NC-WC-0004, Total Solids, Percent Moisture, Ash and Total Volatile Solids

#50 Verify the volume of reagents that are being used with what is stated in SW846.

Response:

Method SW846	Quanterra North Canton
10 mL 1:1 HNO_3	5 mL H_2O, 5 mL HNO_3
if needed to complete digestion:	
2 Additions of 5 mL HNO_3	2 Additions of 5 mL HNO_3
up to 10 mL H_2O_2	up to 10 mL H_2O_2

Method Corp-MT-0001-ICP

#51 List the wavelength that is used for each element on each instrument.

Response:
See Attachment 8.

#52 Provide the actual MDL for each element.

Response:
See attachment 7.

Quanterra Environmental Services

Section 3: Additional Parameters

During the Audit performed on December 20, 1996, the use of Quanterra's new Ion Chromatograph for VAP projects was discussed. It was determined that the laboratory would need to submit an SOP documenting the procedures to be used and acceptable Performance Evaluation (PE) results for all parameters requested under this method of analysis. Attachment 9 is the SOP No. NC-WC-0084, Determination of Inorganic Anions by Ion Chromatography. The SOP has gone through a technical review and is awaiting the final management approval. This will be completed on January 20, 1997. A completed signature page will be faxed to you by January 21, 1997 to complete this document.

The Parameters requested under the USEPA Method 300.0 include Nitrate, Phosphate, Bromide, Chloride, Fluoride and Sulfate.

Attachment 10 is the PE results for the Ion Chromatography parameters and Semivolatile Parameters. The Ion Chromatography PE was not graded for Fluoride. Analytical Products Group was notified on January 16, 1997. Quanterra requested that the report be reissued with this analyte included. The Semivolatiles PE result shows an unacceptable result for Phenols. Quanterra has obtained a second vial for the analysis of this parameter and will report results to Analytical Products Group on Monday January 20, 1997.

If you have any questions or need additional information, please call me at (330) 966-9281 or contact Opal Davis-Johnson Quanterra Quality Assurance Manager at (330)966-9279.

Sincerely,

Mark J. Loeb

ML/ml

Attachments
cc: Letter Only
Opal Davis-Johnson, Quanterra Quality Assurance Manager
Jeff Smith, Quanterra Project Manager
Christopher Oprandi, Quanterra Laboratory Manager
Quanterra VAP Files, Letter and Attachments

Attachment 10

Quanterra Incorporated
4101 Shuffel Drive, NW
North Canton, Ohio 44720

330 497-9396 Telephone
330 497-0772 Fax

Quanterra Environmental Services

Quanterra Incorporated **January 20, 1997**

Add the following to Section 5.6 - Retention and Disposal of Records, of the Quanterra QAMP, Revision No. 1, May 15, 1996:

Pursuant to paragraph (B)(2) of rule 3745-300-04 of the Ohio Administrative Code, all documents prepared or acquired in connection with a known Voluntary Action will be retained for a period of ten years from the date the analyses were submitted to a certified professional.

QUANTERRA STANDARD OPERATING PROCEDURE

TITLE: DETERMINATION OF INORGANIC ANIONS BY ION CHROMATOGRAPHY

(SUPERSEDES: REVISION (ORIGINAL))

Prepared by: Kevin Anthony (for M. Burr)

Reviewed by: ______________________
Technology Standardization Committee

Approved by: ______________________
Director, Quality Assurance

Approved by: ______________________
Director, Environmental Health and Safety

Approved by: ______________________
Management

Mark J. Loeb
Quality Assurance Scientist

Quanterra Incorporated
4101 Shuffel Drive, NW
North Canton, Ohio 44720

330 497-9396 Telephone
330 497-0772 Fax

Quanterra
Environmental Services

January 20, 1997

Darlene L. Stanley
Environmental Specialist; Ohio EPA
1800 WaterMark Drive
Columbus, OH 43215-1099

Dear Ms. Stanley:

Quanterra North Canton offers the following response to Enclosure 3, Certification Requirements/Audit Report Form of the Ohio Environmental Protection Agency's letter dated January 8, 1997. These responses are pursuant to paragraph (G) (4) of rule 3745-300-04 of the administrative code.

Deficiency: Modify SOPs to ensure that they reflect the laboratory's current practices (e.g., method 8270 calibration criteria).

Response:
Quanterra SOPs were written at a corporate level to encompass 12 facilities. Each facility was then responsible for adding the details needed to identify the laboratories current practices. The SOPs submitted, do in fact document the minimum practices used by Quanterra North Canton. As evident in Quanterra North Canton's response to Enclosures 1 & 2 of the letter from Darlene Stanley dated January 8, 1997, all requirements of the Voluntary Action Program will be met. Addendum's to the Corporate level SOPs will be supplied to document the corrective action for the areas of concern.

Deficiency: Implement SW-846 Quality control criteria (e.g. surrogate criteria for 8270, blank contamination criteria, etc.).

Response:
The surrogate control criteria will be met as required in SW-846. Blank contamination criteria will be met as required in SW-846 for all parameters.

Deficiency: Modify sample spiking procedures for chloride and phosphorus. The volume of the spike solution to be added must not exceed 5% of the sample volume.

Response:
This Modification has been completed and an addendum to the SOP will be supplied.

Quanterra *Environmental Services*

Deficiency: A minimum of two cyanide calibration standards, with similar values on the calibration curve, must be distilled with the samples. This is to ensure that the distillation technique is reliable. The results for these distilled standards must agree within +/-10% of the undistilled samples.

Response:
For all known Ohio Voluntary Action Program analyses, the two (2) calibration standards will be distilled and analyzed. The laboratory will use an acceptance criteria of ± 10%. Every effort will be made to ensure the 10 % criteria is meet. If Quanterra is unable to meet this acceptance criteria, the certified professional responsible for the project will be notified. Quanterra will generate a Non-Conformance Memo (NCM) documenting any such anomaly and the reason the laboratory was unable to meet the requirement. Quanterra understands the importance of ensuring the data generated is of sound and legally defensible integrity.

If you have any questions or need additional information, please call me at (330) 966-9281 or contact Opal Davis-Johnson Quanterra Quality Assurance Manager at (330)966-9279.

Sincerely,

Mark J. Loeb

ML/ml

cc Opal Davis-Johnson, Quanterra Quality Assurance Manager
Jeff Smith, Quanterra Project Manager
Christopher Oprandi, Quanterra Laboratory Manager
Quanterra VAP Files

SEVERN TRENT STL

STL NORTH CANTON
USEPA REGION V PROJECT EXPERIENCE *

TYPE OF PROJECT	PROJECT NAME	PROJECT LOCATION	TYPE OF WORK	PERIOD OF PERFORMANCE
RFI	Ispat Inland Steel, Inc	Gary, IN	SW 846 Organic and inorganic parameters	January 2001 - Present
RFI	Rohm & Haas	Reading, OH	SW 846 TAL / TCL, Appendix IX and Water Quality Parameters	March 2001 - Present
RFI/CMS	USS Gary	Gary, IN	SW 846 Appendix IX - including dioxins, water quality and waste characterization parameters	January 2000 - Present
RFI	Republic Technologies International	Canton, OH	SW 846 Appendix IX parameters	June 2000 - Present
Superfund	Pristine Trust	Reading, OH	SW 846 TAL / TCL parameters and Natural Attenuation	June 1999 - Present
RFI	BASF Corp.	Holland, MI	SW 846 Appendix IX - including dioxins	August 1999 - Present
Phase II RFI	BP Refinery	Lima, OH	SW 846 Appendix IX and Skinner List for organic and inorganic parameters	December 1999 - April 2000
Voluntary RCRA Closure	Hoover Co.	Canton, OH	SW 846 Appendix IX, water quality and waste characterization parameters	November 1998 - Present
Superfund	Marina Cliffs/NW Barrel	South Milwaukee, WI	CLP SOW for Organic and Inorganic Parameters	July 1998 - Present
RFI	3M	Cordova, IL	SW 846 Appendix IX & water quality parameters	June 1997 - September 1999
Engineering Evaluation	Allied Signal	Chicago, IL	CLP SOW for Organic and Inorganic Parameters, Waste Characterization	May 1997 - January 1999
RFI	BASF Corp.	Wyandot, MI	SW 846 Appendix IX parameters	June 1996 - November 1999
Superfund	Janesville Disposal Facility	Janesville, WI	Appendix I Parameters	March 1995 - Present
RFI/Closure Monitoring	Brush Wellman, Inc.	Elmore, OH	SW 846 Appendix IX & water quality parameters	November 1994 - Present
RFI/CMS	PPG	Barberton, OH	SW 846 Appendix IX & water quality parameters	June 1993 - Present

* Constitutes a partial listing of STL North Canton's Region 5 experience

STL STANDARD OPERATING PROCEDURE

TITLE: STATISTICAL EVALUATION OF DATA AND DEVELOPMENT OF CONTROL CHARTS

(SUPERSEDES: REVISION 5, DATED 05/03/01)

Reviewed by:	Dorothy J. Leeson	8/30/01 Date
Reviewed by:	Technology Specialist	8/23/01 Date
Approved by:	Quality Assurance Manager	8/6/01 Date
Approved by:	Environmental Health and Safety Coordinator	8-9-01 Date
Approved by:	Laboratory Director	8-14-01 Date

Proprietary Information Statement:

STL STANDARD OPERATING PROCEDURE

TITLE: STATISTICAL EVALUATION OF DATA AND DEVELOPMENT OF CONTROL CHARTS

(SUPERSEDES: REVISION 5, DATED 05/03/01)

Reviewed by: ______________________________ Date

Reviewed by: ______________________________
Technology Specialist Date

Approved by: ______________________________
Quality Assurance Manager Date

Approved by: ______________________________
Environmental Health and Safety Coordinator Date

Approved by: ______________________________
Laboratory Director Date

1. PURPOSE

1.1. The purpose of this SOP is to describe the requirements for: (1) statistically establishing QC acceptance criteria and (2) long-term trend analysis of QC data using control charts at the STL-North Canton Laboratory.

1.2. The control chart is an effective tool for long-term trending because it records in real time the accuracy (bias) and precision of the appropriate parts of the measurement process. The control chart provides the means to demonstrate statistical control.

1.3. This document accurately reflects current standard operating procedures (SOP) as of the date above. All facility SOPs are maintained and updated as necessary by the laboratory QA department.

2. RESPONSIBILITIES

2.1. Analyst

2.1.1. All non-CLP QC data is entered into the Laboratory Information Management System (LIMS) for statistical evaluation for the generation of control charts. (Data entry may be automated or may be completed from the report generation software as part of the report or review group activities.)

2.1.2. Monitor method performance using established limits and identify any out-of-control situation. Respond to out-of-control conditions. QC Data results are considered out of control when recoveries exceed established control limits.

2.2. Group Leader/Supervisor

2.2.1. Respond to out-of-control conditions.

2.3. QA Department Staff

2.3.1. For analytical methods, coordinate updating of control limits at a minimum, annually.. During this process, review control charts to detect any trends in routine analytical procedures.

2.3.2. Archive control charts and statistically derived QC acceptance data.

2.3.3. Each year at a minimum, publish statistically derived QC acceptance criteria.

4.1.3. Control limits shall be generated for each matrix (i.e., aqueous and soil) for preparative methods, using data from at least 20-30 of the most recent data points.

4.1.4. In-house control limits shall be established for the following samples:

4.1.4.1. Laboratory control sample (LCS) spike recoveries for method required analytes list.

4.1.4.2. Matrix Spike and Matrix Spike Duplicate (MS/MSD) spike recoveries for method required analytes list.

4.1.4.3. Surrogate spike recoveries in LCSs for organic analyses only.

4.1.5. Control limits shall be established for all methods except for CLP. For CLP-related projects, the acceptance criteria specified in the most current SOW shall be followed in evaluating data quality. CLP SOWs do not specify the generation of control charts.

4.1.6. The calculations used to generate the control limits for accuracy (%R) are described in the following subsections.

4.1.6.1. The %R is defined as the observed concentration in LCS divided by the theoretical concentration of the spike or LCS, times 100:

$$\%R = \frac{Found}{True} \times 100$$

4.1.6.2. The mean percent recovery and standard deviation is calculated using the following formulas:

$$\overline{\%R} = \frac{\sum_{i=1}^{n} \%R_i}{n}$$

4.1.7. Control limits will be recalculated after excluding the following points from the calculations:

4.1.7.1. Samples with values outside control limits due to assignable cause.

4.1.7.2. True outliers as defined in the Grubbs test.

4.1.8. The LIMS is equipped to perform a Grubbs outlier test used to generate the control charts.

4.2. Monthly Trend Control Charts (Navy Only)

4.2.1. Control charts are required for LCSs only.

4.2.2. Control charts will be generated and reviewed on a monthly basis to keep current assessment of laboratory performance. Charts generated on a monthly basis will include a subset of parameters spiked as indicated in Table 4-1.

Table 4-1

Analyte	Analytical Method	Analyte	Analytical Method
Cyanide	Manual distillation/ automated analysis	Aluminum and Cadmium	Total Prep/ Inductively Coupled Plasma
Thallium	Total Prep, Graphite Furnace Atomic Absorption	Mercury	Manual digestion/ automated CVAA
Trichloroethene	Purge & Trap/ GC Volatile Hall	Toluene	Purge & Trap/ GC Volatile - PID
1,1-Dichloroethene, Benzene	Purge & Trap, GC Mass Spec Volatiles	1,2,4-Trichlorobenzene, 4-Nitrophenol	Liq/Liq, GC Mass Spec Semivolatile
Aldrin, Endrin	Liq/Liq, GC ECD	Aroclor 1016, Aroclor 1260	Liq/Liq, GC ECD
TCMX	Liq/Liq, GC ECD		

4.2.5.2. A minimum of 20 - 30 points are required. If points are below 20 - 30 select close form and increase the start and end date to no more than one year.

4.2.5.3. If points are at least 30, select individual matrix.

4.2.5.4. Select "Grubbs Test"

4.2.5.5. A "Grubbs test complete" sign comes up, select OK

4.2.5.6. Select "Control Limits Rpt". Right click on report and select print.

4.2.5.7. Select "Control Charts Rpt". Right click on report and select print.

4.2.5.8. Close form and repeat 4.2.5.3. through 4.2.5.7.

4.2.5.9. This procedure can be used to demonstrate both "before" and "after" data sets used for control charts generation. An evaluation of the data excluded by a Student-t test is useful to reveal existing problems (high volume of unused analyses, etc.).

4.2.6. The following information must be present on the control charts or in an associated table:

4.2.6.1. Parameter, Analytical Method and preparation procedure

4.2.6.2. LCS Batch ID allowing cross-reference to LIMS containing all analytical information.

4.2.6.3. Matrix

4.2.6.4. Number of points used

4.2.6.5. Mean

4.2.6.6. Standard Deviation

4.2.6.7. Percent recoveries

4.2.6.8. Upper and Lower warning and Control limits

4.2.6.9. Chart generation date.

4.4. Setting Control Limits

4.4.1. The working control limits to be used by the laboratory are based on evaluation of the calculated laboratory statistical performance and available interlaboratory limits provided in the reference methods. Note that some SW-846 methods only supply single-operator or single-laboratory method performance data, which may not be appropriate.

Accuracy Evaluation

Lower Limit Evaluation	Upper Limit Evaluation	Accuracy Decision
Laboratory-generated Lower Limit > Guidance Limit	Laboratory-generated Upper Limit > Guidance Limit	Use laboratory-gen. Lower Limit & Guidance Upper Limit
Laboratory-generated Lower Limit > Guidance Limit	Laboratory-generated Upper Limit < Guidance Limit	Use laboratory-gen. Lower Limit & laboratory-generated Upper Limit
Laboratory-generated Lower Limit < Guidance Limit	Laboratory-generated Upper Limit > Guidance limit	Use guidance Lower Limit & guidance Upper Limit
Laboratory-generated Lower Limit < Guidance Limit	Laboratory-generated Upper Limit < Guidance limit	Use guidance Lower Limit & laboratory-generated Upper Limit

Precision Evaluation

Range Evaluation	Precision Decision
Laboratory-generated precision value > Guidance precision	Use guidance precision
Laboratory-generated precision < Guidance precision	Use laboratory-generated precision

Notes: If the decision is to use guidance limits from the method, the laboratory should investigate procedural improvements leading to better performance.

5. DEFINITIONS

5.1. Control Chart - A graphical QC tool to monitor method performance over time and to establish acceptance limits.

5.2. Relative Percent Difference (RPD) - a measure of intra-lab precision based on a duplicate sample analyses.

5.3. Grubbs Test – extension of sample sizes and percentage points for significant tests of outlying observations - a statistical outlier test.

5.4. Percent Recovery (%R) or Recovery - a measure of the accuracy (bias) of the measurement process based on a comparison of a measured value for a fortified (spiked) QC sample against the known spiked values.

5.5. Precision - a measure of mutual agreement (or variability) among individual measurements of the same property, usually under prescribed similar conditions.

5.6. Accuracy - the degree of agreement of a measurement (or an average of measurements of the same thing) with an accepted reference or true value. Accuracy is the measure of bias inherent in the system.

5.7. Bias - a systematic (consistent) error in test results. The difference between the population mean and the true or reference value, or as estimated from sample statistics; the difference between the sample average and the reference value.

5.8. X-chart - a control chart that plots a single measurement of a property (e.g., percent recovery) of quality control samples over time. The chart consists of a single line that is the mean of the statistic, warning limits at ± two standard deviations, and control limits at ± 3 sigma.

5.9. Assignable cause - a known reason for an outlying result (e.g., no spike added).

5.10. Duplicate: A second aliquot of a sample that is treated the same as the original sample in order to determine the precision of the method.

5.11. Laboratory Control Sample (LCS):

5.11.1. Organics: A LCS is a volume of deionized laboratory water (for water samples) or a suitable solid material (e.g., clean sand) (for soil/sediment samples) which is spiked with compounds of interest and subjected to the entire analytical procedure in order to estimate the accuracy of the method via percent spike recovery.

APPENDIX A

(Examples of Control Charts)

APPENDIX A

(Examples of Control Charts)

Calculated Control Limits

SEVERN TRENT SERVICES

North Canton
Spike List: 928: NC: 8082 Best Practice -LCS

QC Type: ***LCS/DCS***
Analysis Dates: ***05/25/2000 - 06/07/2000***

Associated SACs:

QC	*Method*	*Prep*
01	MY	1U
01	MY	2W
01	MY	57
01	MY	60
01	MY	61
01	MY	63
01	MY	71
01	QH	
2U	MY	61
50	QH	
72	QH	

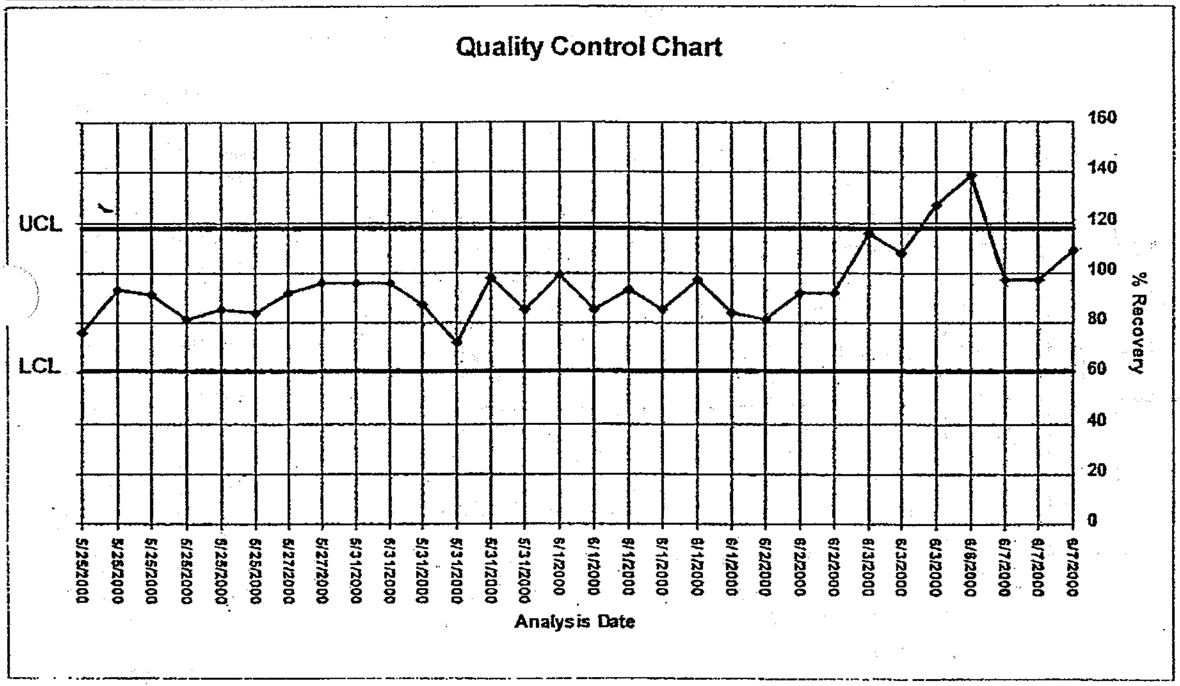
Aqueous

Constituent	*Spike Level*	*Units*	*N*	*Mean*	*Std. Dev.*	*QuantIMS LCL*	*QuantIMS UCL*	*QuantIMS RPD*	*Calculated LCL*	*Calculated UCL*	*Calculated RPD*
PCB-1016	10	ug/L	29	92.90	11.62	61	118	20	58	128	33
PCB-1260	10	ug/L	30	91.20	17.69	61	124	27	38	144	53

PCB-1016 **Laboratory Control Sample** **Aqueous**

QuantIMS Spike List: 928 (NC: 8082 Best Practice -LCS) Analysis Dates: 05/25/2000 - 06/07/2000

Method	Method Description	Extraction
8081	Pesticides/PCBs (8081)	EXTRACTION, SOLID/SOLVENT (Auto shaker) w/ACID STRIP (P
8081	Pesticides/PCBs (8081)	LIQ/LIQ, ACCEL ONE STEP w/ACID STRIP (PCB) - Nominal
8081	Pesticides/PCBs (8081)	LIQ/LIQ, CONT w/ACID STRIP (PCB) - Nominal
8081	Pesticides/PCBs (8081)	LIQ/LIQ, SEP FUNNEL w/ACID STRIP (PCB) - Nominal
8081	Pesticides/PCBs (8081)	SONICATION w/ACID STRIP (PCB)
8081	Pesticides/PCBs (8081)	SOXHLET (Na2SO4) w/ACID STRIP (PCB)
8081	Pesticides/PCBs (8081)	WASTE DILUTION w/ACID STRIP (PCB)
8082	PCBs (8082)	Not specified



Statistical Calculations

N	29
Mean %R:	92.897
Std. Dev.:	11.620
Spike Level:	10
Spike Units:	ug/L
QIMS LCL	61
QIMS UCL	118
CALC LWL	70
CALC UWL	116
CALC LCL	58
CALC UCL	128
N RPD	11
QIMS RPD	20
Calc RPD	33.310

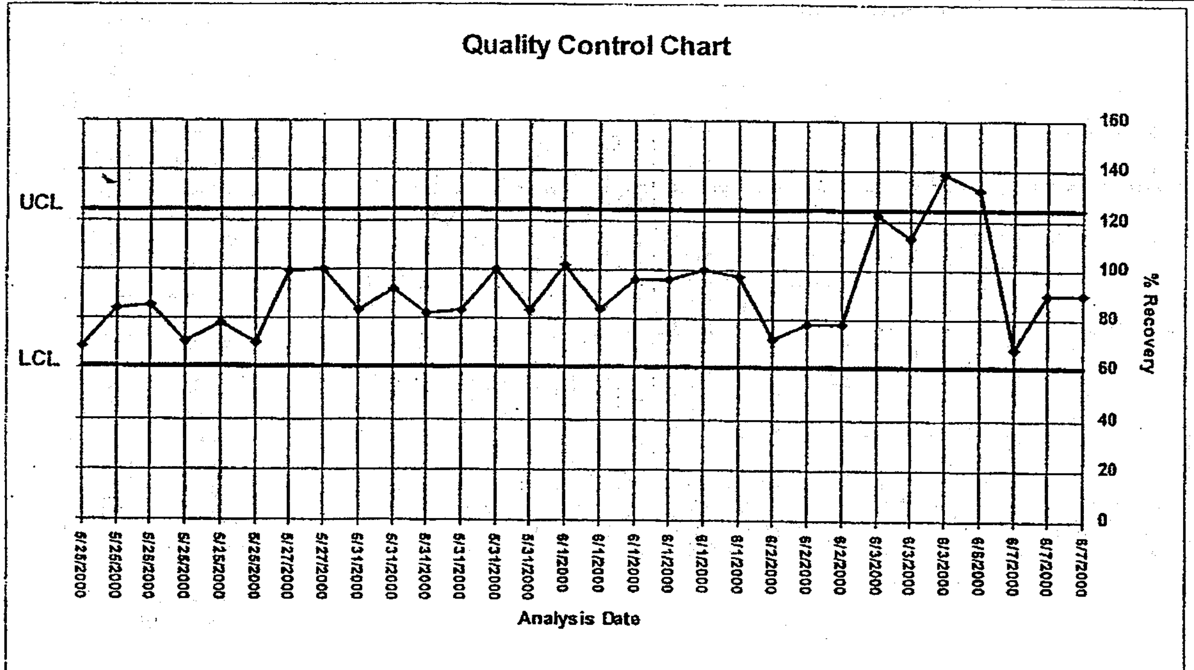
Rejected data points are charted

Generated: 6/19/2000

PCB-1260 **Laboratory Control Sample** **Aqueous**

QuantIMS Spike List: 928 (NC: 8082 Best Practice -LCS) **Analysis Dates: 05/25/2000 - 06/07/2000**

Method	Method Description	Extraction
8081	Pesticides/PCBs (8081)	EXTRACTION, SOLID/SOLVENT (Auto shaker) w/ACID STRIP (P
8081	Pesticides/PCBs (8081)	LIQ/LIQ, ACCEL ONE STEP w/ACID STRIP (PCB) - Nominal
8081	Pesticides/PCBs (8081)	LIQ/LIQ, CONT w/ACID STRIP (PCB) - Nominal
8081	Pesticides/PCBs (8081)	LIQ/LIQ, SEP FUNNEL w/ACID STRIP (PCB) - Nominal
8081	Pesticides/PCBs (8081)	SONICATION w/ACID STRIP (PCB)
8081	Pesticides/PCBs (8081)	SOXHLET (Na2SO4) w/ACID STRIP (PCB)
8081	Pesticides/PCBs (8081)	WASTE DILUTION w/ACID STRIP (PCB)
8082	PCBs (8082)	Not specified



Statistical Calculations

N	30
Mean %R:	91.2
Std. Dev.:	17.69
Spike Level:	10
Spike Units:	ug/L
QIMS LCL	61
QIMS UCL	124
CALC LWL	56
CALC UWL	127
CALC LCL	38
CALC UCL	144
N RPD	12
QIMS RPD	27
Calc RPD	53.323

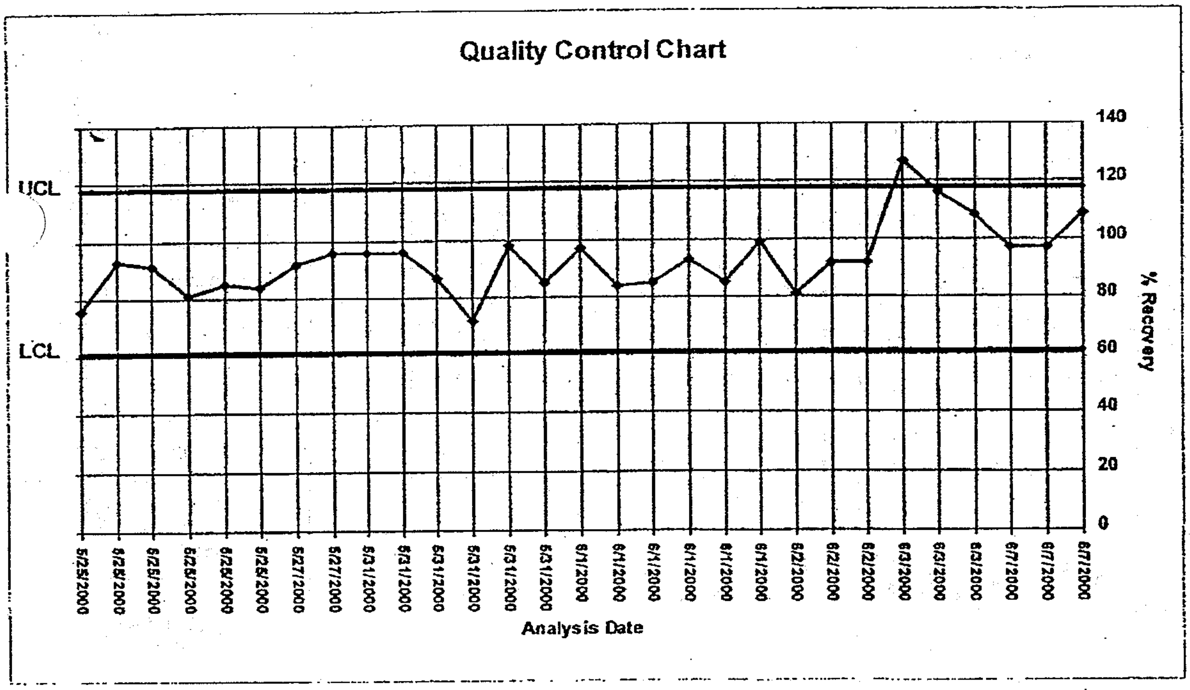
Rejected data points are charted

Generated: 6/19/2000

PCB-1016 Laboratory Control Sample Aqueous

QuantIMS Spike List: 928 (NC: 8082 Best Practice -LCS) Analysis Dates: 05/25/2000 - 06/07/2000

Method	Method Description	Extraction
8081	Pesticides/PCBs (8081)	EXTRACTION, SOLID/SOLVENT (Auto shaker) w/ACID STRIP (P
8081	Pesticides/PCBs (8081)	LIQ/LIQ, ACCEL ONE STEP w/ACID STRIP (PCB) - Nominal
8081	Pesticides/PCBs (8081)	LIQ/LIQ, CONT w/ACID STRIP (PCB) - Nominal
8081	Pesticides/PCBs (8081)	LIQ/LIQ, SEP FUNNEL w/ACID STRIP (PCB) - Nominal
8081	Pesticides/PCBs (8081)	SONICATION w/ACID STRIP (PCB)
8081	Pesticides/PCBs (8081)	SOXHLET (Na2SO4) w/ACID STRIP (PCB)
8081	Pesticides/PCBs (8081)	WASTE DILUTION w/ACID STRIP (PCB)
8082	PCBs (8082)	Not specified



Statistical Calculations

N	29
Mean %R:	92.897
Std. Dev.:	11.620
Spike Level:	10
Spike Units:	ug/L
QIMS LCL	61
QIMS UCL	118
CALC LWL	70
CALC UWL	116
CALC LCL	58
CALC UCL	128
N RPD	11
QIMS RPD	20
Calc RPD	33.310

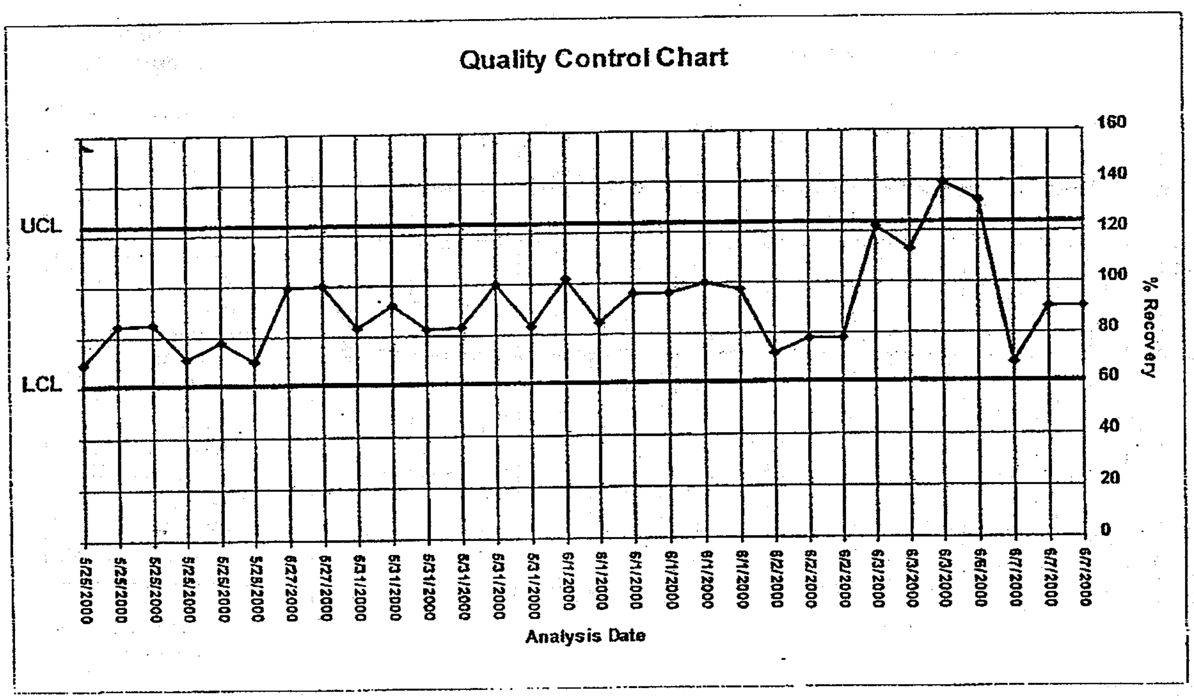
Rejected data points are not charted

PCB-1260 — Laboratory Control Sample — Aqueous

QuantIMS Spike List: 928 (NC: 8082 Best Practice -LCS)

Analysis Dates: 05/25/2000 - 06/07/2000

Method	Method Description	Extraction
8081	Pesticides/PCBs (8081)	EXTRACTION, SOLID/SOLVENT (Auto shaker) w/ACID STRIP (P
8081	Pesticides/PCBs (8081)	LIQ/LIQ, ACCEL ONE STEP w/ACID STRIP (PCB) - Nominal
8081	Pesticides/PCBs (8081)	LIQ/LIQ, CONT w/ACID STRIP (PCB) - Nominal
8081	Pesticides/PCBs (8081)	LIQ/LIQ, SEP FUNNEL w/ACID STRIP (PCB) - Nominal
8081	Pesticides/PCBs (8081)	SONICATION w/ACID STRIP (PCB)
8081	Pesticides/PCBs (8081)	SOXHLET (Na2SO4) w/ACID STRIP (PCB)
8081	Pesticides/PCBs (8081)	WASTE DILUTION w/ACID STRIP (PCB)
8082	PCBs (8082)	Not specified



Statistical Calculations

N	30
Mean %R:	91.2
Std. Dev.:	17.69
Spike Level:	10
Spike Units:	ug/L
QIMS LCL	61
QIMS UCL	124
CALC LWL	56
CALC UWL	127
CALC LCL	38
CALC UCL	144
N RPD	12
QIMS RPD	27
Calc RPD	53.323

Rejected data points are not charted

APPENDIX V

OHIO VAP DATA VALIDATION MEMORANDA

MEMORANDUM

The Payne Firm, Inc.
Environmental Consultants

11231 Cornell Park Drive
Cincinnati, Ohio 45242
513-489-2255 Fax: 513-489-2533

TO: Daniel D. Weed

FROM: Maria R. Arbogast Vieth

DATE: February 3, 2000

SUBJECT: Data Quality Assessment and Validation for Ground Water Samples Collected During November 1998
Vernay Laboratories, Inc.
Voluntary Action Program – Plant 2/3
Yellow Springs, Ohio

PROJECT NO.: 0109.59.12

The following details an analytical data quality assessment and validation for the ground water samples collected during November 1998 from the above-referenced facility. The samples, identified on Table 1, were analyzed for a variety of organic and inorganic constituents by Quanterra Environmental Services (Quanterra) in North Canton, Ohio. The analytical parameters and associated methods are given on Table 2. The quality assurance criteria used to assess the data were consistent with the relevant guidance in "US EPA Contract Laboratory National Functional Guidelines for Organic Data Review", (EPA-540/R-94/012, February 1994) and "US EPA Contract Laboratory National Functional Guidelines for Inorganic Data Review", (EPA-540/R-94/013, February 1994).

<u>Holding Time Periods</u>
The holding times for all parameters are given on Table 3. As indicated by the sample collection and analysis dates on the chain-of-custody forms and the analytical reports provided by Quanterra, all samples were prepared and analyzed within the required holding periods.

<u>Method Blank Samples</u>
Contamination of the samples contributed by laboratory conditions or procedures was monitored by the concurrent preparation and analysis of method blank samples. Iron was detected in the method blank at 0.12 mg/L. Iron was not detected in the associated samples. No other compounds were detected in the method blank samples. Therefore, it is concluded that no significant laboratory contamination occurred.

System Monitoring Compounds/Surrogate Spikes
For VOCs and PAHs, laboratory performance on individual samples was monitored by using percent recoveries of system monitoring compounds/surrogate spikes. All surrogate recoveries met the acceptance criteria.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Results
To assess the long-term accuracy and precision of the analytical methods on sample matrices, MS/MSD percent recoveries and relative percent difference (RPD) of the recoveries were determined. The RPDs and surrogate recoveries were all within acceptable limits. The percent recovery was outside acceptable limits for one of the laboratory QA/QC samples analyzed for methane. The associated QA/QC criteria, including the percent recovery of methane in the paired matrix spike sample and the RPD, were within acceptable limits. Therefore, no qualification is considered necessary. The remaining percent recoveries for all compounds were within acceptable limits. Therefore, no data were qualified based on MS/MSD results.

Laboratory Control Samples (LCS)
LCS percent recoveries and RPDs were reviewed to assess the overall performance and accuracy of the laboratory procedures. The RPDs for eleven of the sixteen compounds in the PAH LCS were outside acceptable limits. The compounds, percent recoveries and RPDs are given on Table 4. There were no PAHs detected in non-spiked samples (i.e., in samples other than the MS/MSD and the LCS). No qualification was considered necessary based on the fact that all percent recoveries for both system monitoring compounds and spiking analytes and that no PAHs were detected in associated samples. The remaining LCS data were acceptable.

Field QA/QC
A field blank, rinsate blank and trip blank were analyzed in conjunction with the samples. These field QA/QC samples were designed to identify the presence of contamination resulting from sample collection and handling procedures in the field and during shipment. The field blank was analyzed for VOCs and PAHs. The rinsate blank was analyzed for VOCs, PAHs and metals. The trip blank was analyzed for VOCs. Methylene chloride was detected in the field blank (4.8 μg/L). Carbon disulfide was detected in the rinsate blank (1.7 μg/L). No other compounds were detected in these samples. Methylene chloride and carbon disulfide were not detected in the associated samples. It is therefore concluded that no significant contamination of samples occurred during sample collection and shipment.

A field duplicate was collected. A comparison of results for field duplicates is given on Table 5. The results are considered acceptable and no qualification is considered warranted.

Overall Assessment
The data exhibited acceptable levels of precision and accuracy and are found to be suitable for all purposes without qualification.

Vernay Laboratories

Yellow Springs, Ohio

Project No. 0109.59.12

The Payne Firm, Inc.

Environmental Consultants

TABLE 1: Sample Identities

MW1-110598
MW2-110598
MW3-110598
MW4-110598
MW5-110598
MW6-110598
DUP-110598

TABLE 2: Analytical Parameters and Methods

Parameters	Method
Alkalinity	MCAWW 310.1
Chloride	MCAWW 300.0A
Dissolved Gasses	EPA9 RSK-175
ICP Metals, Total, Dissolved and Trace	SW846 6010A
Mercury	SW846 7470
Nitrate as N	MCAWW 300.0A
Nitrite as N	MCAWW 300.0A
Phosphate as P	MCAWW 300.0A
Polynuclear Aromatic Hydrocarbons	SW846 8310
Sulfate	MCAWW 300.0A
Total Organic Carbon	MCAWW 415.1
Volatile Organic Compounds	SW846 8260A

EPA-9 Sample Prep and Calculations for Dissolved Gas Analysis in Water Samples Using a GC Headspace Equilibration Technique, RSKSOP-175, REV. 0, 8/11/94, USEPA Research Lab.
MCAWW "Methods for Chemical Analysis of Water and Wastes", EPA-600/4-79-020, March 1983 and subsequent revisions.
SW846 "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 and its updates.

Vernay Laboratories

Yellow Springs, Ohio

Project No. 0109.59.12

The Payne Firm, Inc.

Environmental Consultants

TABLE 3: Holding Times

Method	Constituent	Holding Time
EPA9 RSK-175	Dissolved Gasses	14 days
MCAWW 300.0A	Chloride, Phosphate as P, Sulfate	28 days
MCAWW 300.0A	Nitrate, Nitrite, Orthophosphate	2 days
MCAWW 310.1	Alkalinity	14 days
MCAWW 415.1	Total Organic Carbon	28 days
SW846 6010A	Metals	180 days
SW846 7470	Mercury	180 days
SW846 8260A	VOCs	14 days
SW846 8310	PAHs	7 days to extract, 28 days to analyze

TABLE 4: LCS Results Outside Acceptable Limits

Analyte	% Recovery 1	% Recovery 2	Criteria	RPD	Criteria
Fluorene	29	52	13-100	57	0-43
Phenanthrene	37	69	28-113	59	0-43
Naphthalene	20	36	10-90	58	0-46
Acenaphthylene	22	38	10-99	54	0-49
Anthracene	37	68	18-126	60	0-59
Chrysene	58	104	38-118	56	0-40
Fluoranthene	47	85	43-102	57	0-29
Pyrene	52	95	38-118	58	0-40
Benzo(a)anthracene	57	100	44-116	54	0-36
Benzo(b)fluoranthene	64	112	39-125	54	0-43
Benzo(k)fluoranthene	69	116	38-124	50	0-43

TABLE 5: Comparison of Field Duplicate Results

Detected Compound	Concentration in Original Sample [ug/L]	Concentration in Duplicate Sample [ug/L]	RPD
MW5-110598/DUP-110598			
cis-1,2-Dichloroethene	0.63	0.58	8%
1,2-Dichloroethene (total)	0.63	0.58	8%
1,2-Dichloropropane	3.2	3.2	0%
Tetrachloroethene	29	28	4%
Toluene	2.2	1.9	15%
Trichloroethene	5.5	5.3	4%

MEMORANDUM

The Payne Firm, Inc.
Environmental Consultants

11231 Cornell Park Drive
Cincinnati, Ohio 45242
513-489-2255 Fax: 513-489-2533

TO: Daniel D. Weed, C.P.G.

FROM: Maria R. Arbogast Vieth

DATE: February 3, 2000

SUBJECT: Data Quality Assessment and Validation for Soil, Surface Water, Ground Water and Storm Sewer Water Samples Collected During December 1998 and January 1999
Vernay Laboratories, Inc.
Voluntary Action Program – Plant 2/3
Yellow Springs, Ohio

PROJECT NO.: 0109.59.12

The following details an analytical data quality assessment and validation for the soil, surface water, ground water and storm sewer water samples collected during December 1998 and January 1999 from the above-referenced facility. The samples are identified on Table 1. The samples were analyzed for a variety of organic and inorganic constituents by Quanterra Environmental Services (Quanterra) in North Canton, Ohio. The analytical parameters and associated methods are given on Table 2. The quality assurance criteria used to assess the data were consistent with the relevant guidance in "US EPA Contract Laboratory National Functional Guidelines for Organic Data Review", (EPA-540/R-94/012, February 1994) and "US EPA Contract Laboratory National Functional Guidelines for Inorganic Data Review", (EPA-540/R-94/013, February 1994).

Sample GP-0117-16GW was misidentified by the laboratory as GR-0117-16GW. This is not considered to impact the data quality in any manner.

<u>Holding Time Periods</u>
The holding times for all parameters are given on Table 3. As indicated by the sample collection and analysis dates on the chain-of-custody forms and the analytical reports provided by Quanterra, all samples were prepared and analyzed within the required holding periods.

Method Blank Samples
Contamination of the samples contributed by laboratory conditions or procedures was monitored by the concurrent preparation and analysis of method blank samples. Methylene chloride was detected in a number of the method blank samples associated with the ground water samples and the soil samples. The detected concentrations of the methylene chloride and the batch number are given on Table 4. Methylene chloride is a common laboratory contaminant. Methylene chloride results for associated samples were qualified as non-detects if the original result divided by the dilution factor was less than ten times the result in the associated method blank. Qualified samples are given on Table 5.

System Monitoring Compounds/Surrogate Spikes
For organic analytes (i.e., VOCs and PAHs), laboratory performance on individual samples was monitored using percent recoveries of system monitoring compounds/surrogate spikes. The percent recovery for a single surrogate compounds was outside acceptable limits for one surface water and four soil samples, given on Table 6. No data qualifiers were considered necessary because reanalysis of the samples by the laboratory achieved similar results and the remaining surrogate compounds were within acceptable limits.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Results
To assess the long-term accuracy and precision of the analytical methods on sample matrices, MS/MSD percen recoveries and relative percent difference (RPD) of the recoveries were determined. Samples with percent recoveries or RPDs outside acceptable limits are given on Table 7. PAH data for samples associated with MS/MSD batch numbers 8351112 and 8351268 were qualified as estimated (J/UJ). These samples are listed on Table 8.

Laboratory Control Samples (LCS)
LCS percent recoveries were reviewed to assess the overall performance and accuracy of the laboratory procedures. The percent recovery of acenaphthene was low (i.e., 0%) and the percent recoveries of the remaining fifteen compounds were within acceptable limits for the LCS for batch number 8352168. The associated samples were qualified as estimated (J/UJ) based on the MS/MSD results, as discussed above. No further qualification was deemed necessary. The percent recovery of benzo(a)pyrene was high (136%) and the percent recoveries of the remaining fifteen compounds were within acceptable limits for the LCS for batch number 8355113. The remaining LCS data were acceptable. No qualification was considered warranted.

Field QA/QC
Two equipment rinsate samples were analyzed in conjunction with the samples. These field QA/QC samples were designed to identify the presence of contamination resulting from sample collection and handling procedures in the field and during shipment. The rinsate samples were analyzed for VOCs. Compounds detected in the rinsate samples are given on Table 9. The detection of toluene and methylene chloride in both samples indicates the possible contamination of samples with these compounds during sample collection and handling. No samples were qualified based on this data, but all detections of toluene and methylene chloride in the ground water samples collected during this sampling event should be considered suspect and evaluated as such using considerations outside the scope of this data validation, (e.g., contaminant distribution and data reproducibility).

Two field duplicate ground water samples were collected. A comparison of results for field duplicates is given on Table 10. The results are considered acceptable and no qualification is considered warranted.

<u>Overall Assessment</u>

The majority of the data exhibited acceptable levels of precision and accuracy and are found to be suitable for all RI/FS purposes without qualification. Detections of methylene chloride were qualified as nondetects based on detections in associated method blanks (see Table 4). All detections of methylene chloride and toluene in ground water samples collected during this event are considered suspect, based on equipment rinsate sample results, and should be evaluated for representativeness using factors outside the scope of this data validation. Some PAH results were qualified as estimated (J/UJ) based on MS/MSD results (see Table 8).

Vernay Laboratories

Yellow Springs, Ohio

Project No. 0109.59.12

The Payne Firm, Inc.

Environmental Consultants

TABLE 1: Sample Identities

Surface Water and Storm Sewer Water Samples
SS1-011399
SS2-011399
SS3-011399
SS4-011399
Soil Samples Collected via Geoprobe
GP-0117-0-2
GP-0117-4-6
GP-0117-8-10
GP-0117-12.2-14SS
GP-0118-2.5-3
GP-0118-4-6
GP-0118-8-10
GP-0119-2.6-3.5
GP-0119-4-6
GP-0119-10-12
GP-0120-2-3
GP-0120-4-6
GP-0120-6-8
GP-0120-8-10
GP-0121-0-2
GP-0121-4-6
GP-0121-6-8
GP-0121-8-10
GP-0122-4-6
GP-0122-8-10
GP-0123-6-8
GP-0123-8-10
GP-0124-0-2
GP-0124-4-6
GP-0124-8-10
GP-0125-2-3
GP-0125-4-6
GP-0125-8-10
GP-0126-2-4
GP-0126-4-6
GP-0126-8-10

Vernay Laboratories

Yellow Springs, Ohio

Project No. 0109.59.12

The Payne Firm, Inc.

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TABLE 1: Sample Identities

Soil Samples Collected via Geoprobe
GP-0127-0-2
GP-0127-4-6
GP-0127-8-10
GP-0127-13.2-13.9SS
GP-0130-1-2
GP-0130-6-8
GP-0130-10-12
GP-0130-12.8-13.4SS
GP-0132-8-8.5SS
GP-0133-2-4
GP-0134-0-2
GP-0134-6-8
GP-0136-10.1-11.1SS
GP-0136-13.7-14.7SS
GP-0137-10.1-11.4SS
GP-0137-13.4-15.2SS
GP-0139-2-4
GP-0139-6-8
GP-0139-10-12
GP-0140-2-4
GP-0140-6-8
GP-0140-10-12
GP-0205-10-12
GP-0205-10.3-10.5
GP-0206-13-14SS
GP-0207-15-16SS
GP-0207-18-19SS
Ground Water Samples Collected via Geoprobe
GP-0117-16GW
GP-0118-17GW
GP-0119-16GW
GP-0120-16GW
GP-0121-16GW
GP-0122-14GW
GP-0123-15GW
GP-0124-14GW

Vernay Laboratories
Yellow Springs, Ohio
Project No. 0109.59.12

The Payne Firm, Inc.
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TABLE 1: Sample Identities

Ground Water Samples Collected via Geoprobe
GP-0125-15GW
GP-0126-15GW
GP-0127-17GW
GP-0128-13GW
GP-0129-14GW
GP-0130-15GW
GP-0131-14GW
GP-0132-15GW
GP-0133-17GW
GP-0133-17GW DUP
GP-0134-16GW
GP-0135-17GW
GP-0136-20GW
GP-0137-16GW
GP-0138-17GW
GP-0139-14GW
GP-0140-16GW
GP-0201-10GW
GP-0202-13GW
GP-0203-15GW
GP-0204-15GW
GP-0205-19GW
GP-0206-20GW
GP-0207-21GW
GP-0207-21GW DUP
GP-0208-21GW
GP-0209-19GW
Equipment Rinse Samples
EQUIPRINS-12/17/98
EQUIPRINS-12/22/98

Vernay Laboratories

Yellow Spring, Ohio

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The Payne Firm, Inc.

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TABLE 2: Analytical Parameters and Methods

Parameters	Method
ICP Metals	SW846 6010A
Mercury	SW846 7471A
Polynuclear Aromatic Hydrocarbons	SW846 8310
Volatile Organic Compounds	SW846 8260A

SW846 "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 and its updates.

TABLE 3: Holding Times

Method	Constituent	Holding Time
SW846 6010A	Metals	180 days
SW846 7471A	Mercury	180 days
SW846 8260A	VOCs	14 days
SW846 8310	PAHs	7 days to extract, 28 days to analyze

TABLE 4: Compounds Detected in Methods Blanks

Batch Number	Compound	Concentration
8358192	Methylene Chloride	0.29 ug/L
8361360	Methylene Chloride	0.31 ug/L
8364243	Methylene Chloride	0.39 ug/L
8362248	Methylene Chloride	640 ug/kg
8363190	Methylene Chloride	5.8 ug/kg

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TABLE 5: Sample Results Qualified Because of Detection of Methylene Chloride in Method Blank

Sample ID	Unit	Original Methylene Chloride Result	Dilution Factor	Original Results Adjusted by Dilution Factor	Qualified Methylene Chloride Result
GP-0117-16GW	ug/L	2.1 J,B	3.3	0.6	ND(3.3) U
GP-0118-17GW	ug/L	2600 J,B	7142.8	0.4	ND(7100) U
GP-0119-16GW	ug/L	6.1 J,B	10	0.6	ND(10) U
GP-0120-16GW	ug/L	11 J,B	25	0.4	ND(25) U
GP-0121-16GW	ug/L	1.2 B	1	1.2	ND(1.2) U
GP-0122-14GW	ug/L	3.3 J,B	3.57	0.9	ND(3.6) U
GP-0124-14GW	ug/L	6.9 J,B	16.66	0.4	ND(17) U
GP-0125-15GW	ug/L	0.89 J,B	1	0.9	ND(1.0) U
GP-0126-15GW	ug/L	6.1 J,B	8.33	0.7	ND(8.3) U
GP-0127-17GW	ug/L	1.6 B	1	1.6	ND(1.6) U
GP-0128-13GW	ug/L	1.3 B	1	1.3	ND(1.3) U
GP-0123-15GW	ug/L	0.75 J,B	1	0.8	ND(1.0) U
GP-0120-8-10	ug/kg	690 B	1	690	ND(690) U

TABLE 6: Samples with Surrogate Recoveries Outside Acceptable Limits

Sample ID						
VOCs	1,2-Dichloroethane		Toluene-d4		Bromofluorobenzene	
	% Recovery	Acceptable Limits	% Recovery	Acceptable Limits	% Recovery	Acceptable Limits
SS1-011399	88	69-127	**89**	90-112	100	87-114
GP-0121-6-8	87	61-115	**81**	82-129	70	64-112
GP-0130-10-12	89	61-115	**69**	82-129	77	64-112
GP-0130-12.8-13.4SS	86	61-115	**80**	82-129	89	64-112
GP-0140-10-12	**116**	61-115	96	82-129	104	64-112
PAHs	Benzo(e)pyrene		Terphenyl-d14			
	% Recovery	Acceptable Limits	% Recovery	Acceptable Limits		
GP-0126-8-10	**20**	25-176	23	10-141		

Note: Percent recoveries outside acceptable limits are noted in bold.

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TABLE 7: MS/MSD Results Outside Acceptable Limits

Batch	Analyte	% Recovery 1	% Recovery 2	Criteria	RPD	Criteria
8364243	1,1-Dichloroethene	**115**	107	75-113	5.6	0-20
8355225	Chlorobenzene	**79**	**78**	81-115	0.53	0-18
8364165	Chlorobenzene	**78**	**75**	81-115	3.0	0-18
	Toluene	**75**	**73**	78-126	3.0	0-24
9005126	1,1-Dichloroethene	**116**	**114**	75-113	2.0	0-20
9004256	1,1-Dichloroethene	111	**119**	75-113	7.6	0-20
	Benzene	111	**122**	78-117	9.5	0-17
9005122	Chlorobenzene	**79**	**76**	81-115	3.8	0-18
9005166	Benzene	**119**	110	78-117	7.2	0-17
8351112	Acenaphthene	**0**	**0**	10-124	0	0-50
	Benzo(a)pyrene	**219**	**241**	10-128	9.5	0-50
	Indeno(1,2,3-cd)pyrene	**137**	**152**	10-116	10	0-50
	Naphthalene	28	50	10-122	**57**	0-50
8351268	Acenaphthene	**0**	**0**	10-124	0	0-50
	Indeno(1,2,3-cd)pyrene	84	19	10-116	**126**	0-50
8355113	Acenaphthene	**0**	**0**	10-124	0	0-50
	Benzo(a)pyrene	**131**	**138**	10-128	5.0	0-50
	Benzo(ghi)perylene	94	**123**	10-116	27	0-50
8352303	Chromium	**79**	107	80-120	7.8	0-20
	Mercury	**149**	116	70-130	16	0-20
8354125	Arsenic	**79**	80	80-120	0.9	0-20
	Chromium	**77**	85	80-120	4.9	0-20
	Selenium	**75**	**76**	80-120	1.5	0-20

Note: Results outside acceptable limits are noted in bold.

TABLE 8: Samples Qualified Based on MS/MSD Results

Batch 8351112
GP-0117-4-6
GP-0117-8-10
GP-0118-4-6
GP-0118-8-10
GP-0119-4-6
GP-0119-10-12
GP-0120-4-6
GP-0120-8-10
GP-0121-4-6
GP-0121-8-10
GP-0122-4-6
GP-0122-8-10
GP-0123-6-8
GP-0123-8-10
GP-0124-4-6
GP-0124-8-10
Batch 8351268
GP-0125-4-6
GP-0125-8-10
GP-0126-4-6
GP-0126-8-10
GP-0127-4-6
GP-0127-8-10
GP-0130-1-2
GP-0130-6-8

TABLE 9: Compounds Detected in Equipment Rinsate Samples

Sample ID	Compound	Concentration [ug/L]
EQUIPRINS-12/17/98	Carbon disulfide	0.21
	Methylene Chloride	3.0
	Toluene	0.21
EQUIPRINS-12/22/98	Methylene Chloride	2.0
	Toluene	0.17

Vernay Laboratories

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The Payne Firm, Inc.

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TABLE 10: Comparison of Field Duplicate Results

	Detected Compound	Concentration in Original Sample [ug/L]	Concentration in Duplicate Sample [ug/L]	RPD
GP-0133-17GW				
	1,1-Dichloroethane	17	21	21%
	1,2-Dichloropropane	15	ND(170)	NC
	Tetrachloroethene	3000	2900	3%
	Trichloroethene	210	200	5%
GP-0207-21GW				
	Acetone	11	ND(10)	NC
	Benzene	0.23	0.27	16%
	Chloroform	0.65	0.70	7%
	Ethylbenzene	0.24	0.18	29%
	n-Hexane	0.51	0.36	34%
	Methylene Chloride	1.6	1.6	0%
	Toluene	0.66	0.66	0%
	Xylenes	0.64	0.65	2%

NC - Not calculable.

MEMORANDUM

The Payne Firm, Inc.
Environmental Consultants

11231 Cornell Park Drive
Cincinnati, Ohio 45242
513-489-2255 Fax: 513-489-2533

TO: Daniel D. Weed

FROM: Maria R. Arbogast Vieth

DATE: February 3, 2000

SUBJECT: Data Quality Assessment and Validation for Water and Soil Samples Collected During January and March 1999 from the Vernay Laboratory Site

PROJECT NO.: 0109.59.12

The following details an analytical data quality assessment and validation for the water and soil samples collected during January and March 1999 from the above-referenced facility. The samples, identified on Table 1, were analyzed for a variety of organic and inorganic constituents by Quanterra Environmental Services (Quanterra) in North Canton, Ohio. The analytical parameters and associated methods are given on Table 2. The quality assurance criteria used to assess the data were consistent with the relevant guidance in "US EPA Contract Laboratory National Functional Guidelines for Organic Data Review", (EPA-540/R-94/012, February 1994) and "US EPA Contract Laboratory National Functional Guidelines for Inorganic Data Review", (EPA-540/R-94/013, February 1994).

Holding Time Periods

The holding times for all parameters are given on Table 3. As indicated by the sample collection and analysis dates on the chain-of-custody forms and the analytical reports provided by Quanterra, all samples were prepared and analyzed within the required holding periods except those samples analyzed for polynuclear aromatic hydrocarbons (PAHs). The holding time from sample collection to sample extraction was exceeded for these samples. The holding time used in this validation for analysis method SW846-8310 applies to water samples. No holding time has been established for solid media samples. The sample results are qualified as estimated (J/UJ) to reflect the possible increase in analytical uncertainty.

Method Blank Samples

Contamination of the samples contributed by laboratory conditions or procedures was monitored by the concurrent preparation and analysis of method blank samples. Methylene chloride was detected (5.8 µg/kg) in the method blank associated with Prep Batch # 9070222. Methylene chloride was detected in the associated sample (SED0201). The detection in sample SED0201 was attributed to laboratory contamination of the sample and qualified as nondetect (U). Acenaphthylene was detected (470 µg/kg) in the method blank associated with Prep Batch #9040123. Acenaphthylene was also detected in an associated sample (RW-6 (8-10)). Sample RW-6 (8-10) was re-analyzed for PAHs and acenaphthylene was not detected. The acenaphthylene detection was attributed to laboratory contamination and qualified as nondetect. Results qualified based on detections in method blank samples are summarized on Table 4. No other compounds were detected in method blank samples.

System Monitoring Compounds/Surrogate Spikes
For VOCs and PAHs, laboratory performance on individual samples was monitored by using percent recoveries of system monitoring compounds/surrogate spikes. All surrogate recoveries met the acceptance criteria.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Results
To assess the long-term accuracy and precision of the analytical methods on sample matrices, MS/MSD percent recoveries and relative percent difference (RPD) of the recoveries were determined. The percent recovery or RPD were outside acceptable limits for the samples listed on Table 5. The associated QA/QC criteria were within acceptable limits. Therefore, no qualification is considered necessary. The remaining percent recoveries for all compounds were within acceptable limits. Therefore, no data were qualified based on MS/MSD results.

Laboratory Control Samples (LCS)
LCS percent recoveries and RPDs were reviewed to assess the overall performance and accuracy of the laboratory procedures. All LCS data were within acceptable limits.

Field QA/QC
Field duplicates were collected. A comparison of field duplicate results is given on Table 6. The results are considered acceptable and no qualification is considered warranted.

Overall Assessment
The majority of the data exhibited acceptable levels of precision and accuracy and are found to be suitable for all purposes without qualification. PAH results for the solid media samples were qualified as estimated (J/UJ) based on holding time exceedance. A limited number of detections were qualified as nondetects based on detections in associated method blanks, see Table 4.

Vernay Laboratories, Inc.

Yellow Springs, Ohio

Project No. 0109.59.12

The Payne Firm, Inc.

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TABLE 1: Sample Identities

Soil Samples
RW-6 (0-2)
RW-6 (6-8)
RW-6(8-10
RW-4 (2-4)
RW-4 (6-8)
RW-4 (8-10)
Ground Water Samples Collected via Geoprobe
GP-0210-16GW
GP-0211-14.7GW
GP-0212-14.6GW
GP-0213-15.5GW
GP-0214-16.6GW
GP-0214-16.6GWDUP
GP-0215-16GW
GP-0216-14.3GW
GP-0217-13.5GW
GP-0218-13GW
GP-0219-14.4GW
Surface Water and Sediment Samples
ST0201/030499
ST0202/030499
ST0203/030499
ST0204/030499
ST0205/030499
ST0206/030499
ST0207/030499
ST0208/030499
ST0101/030499
ST0102/030499
ST0103/030499
ST0104/030499
ST0105/030499
ST0106/030499
ST0107/030499
DUPLICATE/030499
SED0201/030499
Ground Water Samples
MW-0201-032594
MW-0202-032594
MW-0203-032594
MW-0204-032594
MW-0205-032594
MW-0206-032599
MW-0207-032599
MW-7-032699
MW-8-032699
MW-9-032699
MW-10-032699
MW-10-032699 DUP

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Yellow Springs, Ohio

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TABLE 2: Analytical Parameters and Methods

Parameters	Method
ICP Metals	SW846 6010A
Mercury	SW846 7471A
Polynuclear Aromatic Hydrocarbons	SW846 8310
Volatile Organic Compounds in Soil	SW846 8260A
Volatile Organic Compounds in Water	SW846 8260B

SW846 "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 and its updates.

TABLE 3: Holding Times

Method	Holding Time
SW846 6010A	180 days
SW846 7471A	
SW846 8260A & 8260B	14 days
SW846 8310	7 days to extraction, 28 days to analysis

TABLE 4: Sample Results Qualified Because of Detections in Method Blank Samples

Sample ID	Unit	Compound	Original Result	Qualified Result
SED0201	ug/kg	Methylene Chloride	10 B	ND(10) U
RW-6 (8-10)	ug/kg	Acenaphthylene	230 B	ND(230) U

TABLE 5: MS/MSD Results Outside Acceptable Limits

Prep Batch #	Analyte	% Recovery 1	% Recovery 2	Criteria	RPD	Criteria
9041127	Toluene	128	120	78-126	3	0-24
9040123	Anthracene	76	44	10-126	53	0-50
	Flourene	55	23	10-142	83	0-50
	Naphthalene	56	20	10-122	96	0-50
	Phenanthrene	64	35	10-155	59	0-50
9034103	Barium	118	209	80-120	30	0-20
	Cadmium	133	162	80-120	11	0-20
	Chromium	112	132	80-120	5.2	0-20
	Silver	110	125	80-120	13	0-20

RPD = Relative Percent Difference

Vernay Laboratories, Inc.

Yellow Springs, Ohio

Project No. 0109.59.12

The Payne Firm, Inc.

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TABLE 6: Comparison of Field Duplicate Results

Detected Compound	Concentration in Original Sample [ug/L]	Concentration in Duplicate Sample [ug/L]	RPD
GP-0214-16.6GW			
Methylene Chloride	2.0	2.4	18%
ST0107			
1,2-Dichloroethene (total)	25	26	4%
Tetrachloroethene	58	61	5%
Trichloroethene	7.0	7.4	6%

RPD = Relative Percent Difference

MEMORANDUM

The Payne Firm, Inc.
Environmental Consultants

11231 Cornell Park Drive
Cincinnati, Ohio 45242
513-489-2255 Fax: 513-489-2533

TO: Dan D. Weed, C.P.G.

FROM: Mark Berkich

DATE: August 16, 2000

SUBJECT: Data Quality Assessment and Validation for Samples Collected during April 1999 from The Vernay Laboratory Site

PROJECT NO.: 0109.59.12

The following details an analytical data quality assessment and validation for the samples collected during April 1999 from the above-referenced facility. Quanterra Environmental Services (Quanterra) in North Canton, Ohio analyzed the samples, identified on Table 1, for a variety of organic and inorganic constituents. The analytical parameters and associated methods are given on Table 2. The quality assurance criteria used to assess the data were consistent with the relevant guidance in "US EPA Contract Laboratory National Functional Guidelines for Organic Data Review," (EPA-540/R-94/012, February 1994) and "US EPA Contract Laboratory National Functional Guidelines for Inorganic Data Review," (EPA-540/R-94/013, February 1994).

Holding Time Periods

The holding times for all parameters are given on Table 3. As indicated by the sample collection and analysis dates on the chain-of-custody forms and the analytical reports provided by Quanterra, all samples were prepared and analyzed within the required holding periods.

Method Blank Samples

Contamination of the samples contributed by laboratory conditions or procedures was monitored by the concurrent preparation and analysis of method blank samples. Methylene chloride was detected in the method blank associated with batches 9115141, 9111427, 9111427, and 9119326. There were no affected samples associated with these batches.

System Monitoring Compounds/Surrogate Spikes

For organic analysis, laboratory performance on individual samples was monitored by using percent recoveries of system monitoring compounds/surrogate spikes. Table 4 lists the samples that were outside the accepted range for recovery. All samples were considered acceptable based on the criteria for corrective action required by QAPjP or their associated QC being within acceptable limits.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Results

To assess the long-term accuracy and precision of the analytical methods on sample matrices, MS/MSD percent recoveries and relative percent difference (RPD) of the recoveries were determined. Table 5 lists the MS/MSD batches that had percent recoveries and RPDs outside acceptable limits. Table 6 lists the samples associated with these batches.

Laboratory Control Samples (LCS)

LCS percent recoveries and RPDs were reviewed to assess the overall performance and accuracy of the laboratory procedures. All LCS data were within acceptable limits.

Overall Assessment

The majority of the data exhibited acceptable levels of precision and accuracy and is found to be suitable for all purposes without qualification. Table 6 lists samples that had percent differences between the original and confirmation greater than 50%. Quanterra indicated that the results of these samples are suspect.

Vernay Laboratories, Inc.
Yellow Springs, Ohio
Project No. 0109.59.12

The Payne Firm, Inc.
Environmental Consultants

TABLE 1: Sample Identities

Date	Matrix	ID
4/7/1999	Water	BSB-1-040799
4/12/1999	Soil	GP0151-0-2
		GP0151-4-6
		GP0151-8-10
		GP0150-0-2
		GP0150-4-6
		GP0150-8-10
		GP0149-0-2
		GP0149-4-6
		GP0149-8-10
		GP0148-0-2
		GP0148-4-6
		GP-148-8-10
	Water	GP0151-16GW
		GP0150-17GW
		GP0149-17GW
		GP0148-18GW
4/13/1999	Soil	GP0155-0-2
		GP0155-4-6
		GP0155-8-10
		GP0179-0-2
		GP0179-4-6
		GP0179-8-10
		GP0180-0-2
		GP0180-4-6
		GP0180-8-10
		GP0152-0-2
		GP0152-4-6
		GP0152-8-10
		GP0153-0-2
		GP0153-4-6
		GP0153-8-10
		GP0154-0-2
		GP0154-4-6
		GP0154-8-10
		TRIP BLANK
		EQUIPRINSE-041399
		GP0154-13GW
		GP0150-16-18

TABLE 1: Sample Identities

Date	Matrix	ID
4/14/1999	Soil	GP0141-0-2
		GP0141-2-4
		GP0141-4-6
		GP0142-0-2
		GP0142-2-4
		GP0142-4-6
		GP0143-0-2
		GP0143-2-4
		GP0144-0-2
		GP0144-2-4
		GP0145-0-2
		GP0145-2-4
		GP0146-0-2
		GP0146-2-4
		GP0147-0-2
		GP0147-2-4
		GP0163-0-2
		GP0163-4-6
		GP0163-8-10
		GP0159-0-2
		GP0159-4-6
		GP0159-8-10
4/15/1999	Water	EQUIPRINSE-041599
	Soil	GP0162-0-2
		GP0162-2-4
		GP0161-0-2
		GP0161-2-4
		GP0160-0-2
		GP0160-2-4
		GP0177-0-2
		GP0177-2-4
		GP0176-0-2
		GP0176-2-4
		GP0178-0-2
		GP0178-2-4
		GP0157-15-16
	Water	TRIP BLANK

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Yellow Springs, Ohio

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The Payne Firm, Inc.

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TABLE 1: Sample Identities

Date	Matrix	ID
4/16/1999	Soil	GP0158-14-16
		GP0156A-16-18
4/20/1999	Water	RW-2-2
		RW-3-2
		RW-4-2
		RW-5-2
		RW-1-1
		RW-2-1
		RW-3-1
		RW-4-1
		RW-5-1
4/21/1999	Soil	RW-2-4
		RW-3-4
		RW-4-4
		RW-5-4
		RW-2-5
		RW-3-5
		RW-4-5
		RW-5-5
		RW-2-3
		RW-3-3
		RW-4-3
		RW-5-3
4/23/1999		RW-2-6
		RW-3-6
		RW-4-6
		RW-5-6
4/24/1999		GP0173-0-2
		GP0173-4-6
		GP0173-8-10
		GP0174-0-2
		GP0174-4-6
		GP0174-8-10
		GP0172-0-2
		GP0172-4-6
		GP0172-8-10
		GP0171-0-2
		GP0171-4-6
		GP0171-8-10

Vernay Laboratories, Inc.

Yellow Springs, Ohio

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The Payne Firm, Inc.

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TABLE 1: Sample Identities

Date	Matrix	ID
4/24/1999 (cont.)	Soil	GP0170-0-2
		GP0170-4-6
		GP0170-8-10
		GP0169-0-2
		GP0167-0-2
		GP0167-4-6
		GP0167-8-10
		GP0158-14-16
		GP0156A-16-18
		GP0170-14-16
		GP0170-21-23
		GP0171-18-20
		GP0171-12-14
		GP0165-0-2
		GP0165-4-6
		GP0165-8-10
		GP0168-0-2
		GP0169-4-6
		GP0168-8-10
		GP0173-19GW
		GP0171-19GW
		GP0170-22GW
		RINSATE-042499
		FIELD BLANK-042499
		GP0167-22GW
		GP0165-22GW
		GP0168-22GW
4/25/1999	Soil	GP0166-2-4
		GP0164-0-2
		GP0164-4-6
		GP0164-8-10
4/27/1999	Water	RW-3-7
		RW-4-7
		RW-2-7
		RW-5-7
		RW-1-7

TABLE 2: Analytical Parameters and Methods

Parameter	Method
Hexavalent Chromium	SW846 7196A
Volatile Organic Compounds	SW846 8260B
Metals	SW846 6010B
Mercury	SW846 7471A
Polynuclear Aromatic Hydrocarbons	SW846 8310
PCBs	SW846 8082
Semivolatile Organic Compounds	SW846 8270C
Total Recoverable Petroleum Hydrocarbons	MCAWW 418.1
Percent Solids	MCAWW 160.3
Organochlorine Pesticides	SW8468081A

SW846 "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," Third Edition, November 1986 and its updates.

MCAWW "Methods for Chemical Analysis of Water and Wastes," EPA-600/4-79-020, March 1983 and subsequent revisions.

Vernay Laboratories, Inc.
Yellow Springs, Ohio
Project No. 0109.59.12

The Payne Firm, Inc.
Environmental Consultants

TABLE 3: Holding Times

Method	Constituent	Holding Time
SW846 7196A	Chromium	24hrs
SW846 8260B	VOCs	14 days
SW846 6010B	Metals	180 days
SW846 7471A	Mercury	180 days
SW846 8310	PAHs	7 days to extract, 28 days to analyze
SW846 8082	PCBs	Solid -14 days to extract, liquid 7 days to extract, 40 days after extraction
SW846 8270C	SVOCs	Solid -14 days to extract, liquid 7 days to extract, 40 days after extraction
MCAWW 418.1	TPH	14 days
SW846 8081A	Organochlorine Pesticides	Solid -14 days to extract, liquid 7 days to extract, 40 days after extraction

Vernay Laboratories, Inc.

Yellow Springs, Ohio

Project No. 0109.59.12

The Payne Firm, Inc.

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TABLE 4: Samples with Surrogate Recoveries Outside Acceptable Limits

Sample ID								
	1,2-Dichloroethane-d4		Toluene-d8		Bromofluorobenzene		Dibromofluoromethane	
VOCs	% Recovery	Acceptable Limits	% Recovery	Acceptable Limits	% Recovery	Acceptable Limits	% Recovery	Acceptable Limits
GP0180-4-6	**127**	75-117	**130**	86-122	128	60-137	125	70-135
GP0180-8-10	**133**	75-117	**132**	86-122	136	60-137	131	70-135
GP0153-4-6	**128**	75-117	**127**	86-122	119	60-137	125	70-135
GP0154-8-10	116	75-115	**131**	86-122	128	60-137	117	70-135
GP0150-16-18	104	75-117	**201**	86-122	**187**	60-137	115	70-135
GP0161-0-2	84	75-117	**85**	86-122	96	60-137	96	70-135
GP0160-0-2	81	75-117	**81**	86-122	92	60-137	92	70-135
GP0160-2-4	84	75-117	**84**	86-122	94	60-137	97	70-135
GP0177-0-2	82	75-117	**84**	86-122	95	60-137	94	70-135
GP0178-2-4	88	75-117	**84**	86-122	92	60-137	98	70-135
GP0157-15-16	**137**	75-117	**195**	86-122	131	60-137	131	70-135
GP0174-4-6	116	75-117	117	86-122	**146**	60-137	119	70-135
GP0171-0-2	**138**	51-124	**146**	58-116	**148**	53-122	**149**	49-119
GP0170-14-16	**0**	75-117	**78**	86-122	78	60-137	83	70-135
GP0171-12-14	82	75-117	**69**	86-122	80	60-137	76	70-135
GP0165-4-6	**74**	75-117	**82**	86-122	**59**	60-137	96	70-135
GP0165-8-10	**72**	75-117	**80**	86-122	71	60-137	92	70-135
GP0164-8-10	113	75-117	**126**	86-122	**198**	60-137	113	70-135
GP0144-2-4	**71**	75-117	**74**	86-122	**53**	60-137	91	70-135
GP0147-0-2	**118**	75-117	**126**	86-122	122	60-137	116	70-135
GP0163-0-2	80	75-117	**85**	86-122	102	60-137	88	70-135
GP0163-8-10	**74**	75-117	**82**	86-122	98	60-137	86	70-135
GP0151-8-10	117	75-117	**137**	86-122	128	60-137	120	70-135
GP0149-0-2	78	75-117	**81**	86-122	91	60-137	89	70-135
GP0149-4-6	**126**	75-117	**138**	86-122	122	60-137	128	70-135
RW-5-2	114	64-140	**83**	84-112	108	75-122	110	77-127
RW-2-1	114	64-140	**83**	84-112	104	75-122	111	77-127

Note: Percent Recoveries in bold are outside acceptable limits.

Vernay Laboratories, Inc.

Yellow Springs, Ohio

Project No. 0109.59.12

The Payne Firm, Inc.

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TABLE 4: Samples with Surrogate Recoveries Outside Acceptable Limits

PAHs	Benzo (e) pyrene		Terphenyl-d14	
	% Recovery	Acceptable Limits	% Recovery	Acceptable Limits
GP0155-0-2	**0**	25-176	114	10-141
GP0152-0-2	**329**	25-176	**259**	10-141
GP0154-4-6	**24**	25-176	51	10-141
GP0162-2-4	**19**	25-176	43	10-141
GP0161-0-2	**16**	25-176	35	10-141
GP0161-2-4	**21**	25-176	53	10-141
GP0176-0-2	**691**	25-176	**633**	10-141
GP0177-2-4	**23**	25-176	56	10-141
GP0171-4-6	**22**	25-176	56	10-141
GP0170-0-2	107	25-176	**178**	10-141
GP0170-4-6	81	25-176	**364**	10-141
GP0164-0-2	**2410**	25-176	**4060**	10-141
GP0164-4-6	**0**	25-176	**158**	10-141
GP0141-0-2	**1460**	25-176	**2170**	10-141
GP0141-2-4	113	25-176	**176**	10-141
GP0142-0-2	**2100**	25-176	**4590**	10-141
GP0142-2-4	132	25-176	82	10-141
GP0143-0-2	**0**	25-176	**191**	10-141
GP0144-0-2	**0**	25-176	**106**	10-141
GP0144-2-4	72	10-129	**267**	10-138
GP0146-0-2	69	10-129	**141**	10-138
GP0146-2-4	**570**	25-176	**400**	10-141
GP0147-0-2	**305**	25-176	**384**	10-141
GP0147-2-4	89	10-129	**0**	10-138
GP0150-0-2	70	25-176	**170**	10-141

Note: Percent Recoveries in bold are outside acceptable limits.

Vernay Laboratories, Inc.

Yellow Springs, Ohio

Project No. 0109.59.12

The Payne Firm, Inc.

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TABLE 5: MS/MSD Results Outside Acceptable Limits

Batch #	Analyte	% Recovery 1	% Recovery 2	Criteria	RPD	Criteria
9120106	Dibenz (a,h) anthracene	**170**	105	10-110	48	0-50
9105293	Dibenz (a,h) anthracene	110	**952**	10-110	**55**	0-50
	Naphthalene	**0**	652	10-122	**200**	0-50
	Phenanthrene	**766**	**399**	10-155	**101**	0-50
9117242	Lindane	73	**11**	28-125	**148**	0-51
	Heptachlor	65	**9.4**	24-168	**149**	0-73
	Aldrin	76	**10**	31-123	**152**	0-42
	Dieldrin	90	**11**	32-145	**155**	0-43
	Endrin	87	**13**	32-137	**148**	0-45
	4,4'-DDT	95	11	10-151	**157**	0-50
9111104	Acenaphthylene	**241**	**0**	10-130	**200**	0-50
	Benzo (a) pyrene	0	**384**	10-128	**200**	0-50
	Phenanthrene	**0**	295	10-155	**200**	0-50
9108107	Benzo (k) fluoranthene	**0**	**0**	10-159	0	0-50
	Dibenz (a,h) anthracene	43	25	10-110	55	0-50
	Fluoranthene	**178**	104	14-123	52	0-50

Note: Percent Recoveries in bold are outside acceptable limits.

TABLE 6: Samples Associated with MS/MSD Percent Recovery and RPD Exceedences

Batch 9120106
GP0166-2-4
GP0164-0-2
Batch 9105293
GP0141-2-4
GP0145-0-2
GP0163-0-2
GP0142-0-2
GP0144-0-2
GP0142-2-4
GP0144-2-4
GP147-2-4
Batch 9117242
GP0143-2-4
Batch 9111104
GP0155-0-2
Batch 9108107
GP0160-0-2
GP0160-2-4
GP0177-2-4
GP0176-2-4
GP0157-15-16
GP0176-0-2

MEMORANDUM

The Payne Firm, Inc.
Environmental Consultants

11231 Cornell Park Drive
Cincinnati, Ohio 45242
513-489-2255 Fax: 513-489-2533

TO: Dan D. Weed, C.P.G.

FROM: Mark E. Berkich

DATE: February 3, 2000

SUBJECT: Data Quality Assessment and Validation for Samples Collected during May 1999 from The Vernay Laboratory Site

PROJECT NO.: 0109.59.12

The following details an analytical data quality assessment and validation for the samples collected during May 1999 from the above-referenced facility. Quanterra Environmental Services (Quanterra) in North Canton, Ohio analyzed the samples identified in Table 1, for a variety of organic and inorganic constituents. The analytical parameters and associated methods are listed on Table 2. The quality assurance criteria used to assess the data were consistent with the relevant guidance in "US EPA Contract Laboratory National Functional Guidelines for Organic Data Review," (EPA-540/R-94/012, February 1994) and "US EPA Contract Laboratory National Functional Guidelines for Inorganic Data Review," (EPA-540/R-94/013, February 1994).

Holding Time Periods

The holding times for all parameters are given on Table 3. As indicated by the sample collection and analysis dates on the chain-of-custody forms and the analytical reports provided by Quanterra, all samples were prepared and analyzed within the required holding periods.

Method Blank Samples

Contamination of the samples contributed by laboratory conditions or procedures was monitored by the concurrent preparation and analysis of method blank samples. Methylene chloride was detected (1.8 ug/L) in the method blank associated with Prep Batch # 9152166. The samples associated with Prep Batch # 9152166 ere non-detect for methylene chloride and were not qualified.

System Monitoring Compounds/Surrogate Spikes

For organic analysis, laboratory performance on individual samples was monitored by using percent recoveries of system monitoring compounds/surrogate spikes. Table 4 lists the samples that were outside the accepted range for recovery. All samples were considered acceptable based on the criteria for corrective action required by QAPjP or their associated QC being within acceptable limits.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Results

To assess the long-term accuracy and precision of the analytical methods on sample matrices, MS/MSD percent recoveries and relative percent difference (RPD) of the recoveries were determined. The percent recovery and RPD for all QA/QC samples were within limits. However, for some analytes associated with the MS/MSD reports associated with the metals analysis, percent recovery and RPD were not calculated due to sample concentrations reading greater than four times the spike amount. The associated samples were diluted and analyzed. No sample qualification was necessary.

Laboratory Control Samples (LCS)

LCS percent recoveries and RPDs were reviewed to assess the overall performance and accuracy of the laboratory procedures. The LCS associated with Prep Batch #9132270 had eight compounds that failed the percent recovery criteria. These are listed on Table 5. The associated samples (MW2CD/051199 and MW25E/051199) were analyzed a seconded time for PAHS and were non-detect. However, the holding time had been exceeded. The data was considered adequate.

Overall Assessment

The majority of the data exhibited acceptable levels of precision and accuracy and is found to be suitable for all purposes without qualification.

Vernay Laboratories

Yellow Springs, Ohio

Project No. 0109.59.12

The Payne Firm, Inc.

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Table 1: Sample Identities

Date	Matrix	ID
5/4/99	Water	RW-2-8
		RW-3-8
		RW-4-8
		RW-5-8
		RW-1-8
5/11/99	Water	MW2SE/51199
		MW2CD/51199
		RW-1-9
		RW-2-9
		RW-3-9
		RW-4-9
		RW-5-9
5/12/99	Water	MW1/051299
		MW5/051299
		MW9/051299
		MW3CD/051299
		MW4CD/051299
		MW5CD/051299
		FIELD BLANK #1/051299
		RINSEATE #1/051299
		MW-7/051299
		MW-8/051299
		MW-2/051299
		MW-3/051299
5/13/99	Water	860 Dayton Street/051399
		MW0201/051399
		MW0202/051399
		MW0203/051399
		MW0204/051399
		MW0205/051399
		MW0206/051399
		MW0207/051399
		MW6/051399
		MW10/051399
		MW4/051399
		DUPLICATE #1/051399
		DUPLICATE #2/051399
		FIELD BLANK #2/051399
		RINSATE #2/051399

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Project No. 0109.59.12

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Table 1: Sample Identities

Date	Matrix	ID
5/14/99	Soil	SED0201/051499
		SED0202/051499
		SED0203/051499
		SED0204/051499
		SED0205/051499
		SED0206/051499
	Water	ST0203/051499
		ST0205/051499
		ST0209/051499
		ST0206/051499
		ST0207/051499
5/20/99	Water	RW-1-10
		RW-2-10
		RW-3-10
		RW-4-10
		RW-5-10
5/21/99	Air	AIR-0101/052199
		AIR-0102/052199
		AIR-0103/052199
		AIR-0104/052199
		AIR-0105/052199
		AIR-0106/052199
	Water	MW-11/052199
5/23/99	Water	HYDROFLOW/0523/99

TABLE 2: Analytical Parameters and Methods

Parameters	Method
Volatile Organics by TO14	EPA-19 TO-14
Metals	SW846 6010B
Mercury	SW846 7470A
Polynuclear Aromatic Hydrocarbons	SW846 8310
Volatile Organic Compounds	SW846 8260B
Hexavalent Chromium	SW846 7196A
Total Organic Carbon	SMCA Walkley-Black
Percent Solids	MCAWW 160.3

EPA-19 "Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air", EPS/600/4-89/017, June 1988.

SMCA 90-3, Standard Methods of Chemical Analysis, 6th Edition, D. Van Nostrand Co., Princeton, N.J., 1963

MCAWW "Methods for Chemical Analysis of Water and Wastes", EPA-600/4-79-020, March 1983 and subsequent revisions.

SW846 "Test Methods for Evaluating Solid Waste, Physical /Chemical Methods", Third Edition, November 1986 and its updates.

Vernay Laboratories, Inc.
Yellow Springs, Ohio
Project No. 0109.59.12

The Payne Firm, Inc.
Environmental Consultants

TABLE 3: Holding Times

Method	Constituent	Holding Time
EPA-19 TO-14	VOCs	
SW846 6010B	Metals	180 days
SW846 7470A	Mercury	180 days
SW846 8310	PAHs	7 days to extract, 28 days to analyze
SW846 8260B	VOCs	14 days
SW846 7196A	Hexavalent Chromium	24 hrs
SMCA Walkley-Black	TOC	28 days
MCAWW 160.3	Percent Solids	

Table 4: Samples with Surrogate Recoveries Outside Acceptable Limits

Sample ID								
VOCs	1,2-Dichloroethane-d4		Toluene-d8		Bromofluorobenzene		Dibromofluoromethane	
	% Recovery	Acceptable Limits	% Recovery	Acceptable Limits	% Recovery	Acceptable Limits	% Recovery	Acceptable Limits
SED0204/051499	112	75-112	**145**	86-122	**159**	60-137	101	70-135
SED0205/051499	**119**		**142**	86-122	**169**	60-137	112	70-135

PAHs	Benzo (e) pyrene		Terphenyl-d14	
	% Recovery	Acceptable Limits	% Recovery	Acceptable Limits
MW4/051399	**0**	39-182	**21**	33-120
MW25E/051199	**23**	39-182	40	33-120
MW2CD/051199	**15**	39-182	**27**	33-120
MW1/051299	**38**	39-182	71	33-120
MW9/051299	**37**	39-182	68	33-120
MW3CD/051299	**38**	39-182	70	33-120
MW5CD/051299	**37**	39-182	67	33-120
MW-7/051299	**37**	39-182	67	33-120
MW-8/051299	**37**	39-182	67	33-120
MW-2/051299	**35**	39-182	66	33-120
MW-3/051299	**37**	39-182	66	33-120

Note: Percent recoveries in bold are outside acceptable limits.

Vernay Laboratories, Inc.

Yellow Springs, Ohio

Project No. 0109.59.12

The Payne Firm, Inc.

Environmental Consultants

Table 5: LCS Results Outside Acceptable Limits

Analyte	% Recovery 1	% Recovery 2	Criteria	RPD	Criteria
Batch # 9132270					
Fluorene	**0**	**0**	13-100	0	0-43
Chrysene	42	34	38-119	20	0-40
Fluoranthene	41	**34**	43-102	18	0-29
Pyrene	43	**36**	38-118	18	0-40
Benzo (a) fluoranthene	**43**	**35**	44-116	21	0-36
Benzo (b) fluoranthene	42	**34**	39-125	22	0-43
Benzo (k) fluoranthene	**35**	**28**	38-124	22	0-43
Indeno (1,2,3-cd) pyrene	39	35	36-116	30	0-44

Note: Percent Recoveries in bold are outside acceptable limits.

MEMORANDUM

The Payne Firm, Inc.
Environmental Consultants

11231 Cornell Park Drive
Cincinnati, Ohio 45242
513-489-2255 Fax: 513-489-2533

TO: Dan D. Weed, C.P.G.

FROM: Mark E. Berkich

DATE: February 3, 2000

SUBJECT: Data Quality Assessment and Validation for Samples Collected during November and December 1999 from the Vernay Laboratory Site

PROJECT NO.: 0109.59.12

The following details an analytical data quality assessment and validation for the samples collected during November and December 1999 from the above-referenced facility. Quanterra Environmental Services (Quanterra) in North Canton, Ohio analyzed the samples, identified on Table 1, for a variety of organic and inorganic constituents. The analytical parameters and associated methods are given on Table 2. The quality assurance criteria used to assess the data were consistent with the relevant guidance in "US EPA Contract Laboratory National Functional Guidelines for Organic Data Review," (EPA-540/R-94/012, February 1994) and "US EPA Contract Laboratory National Functional Guidelines for Inorganic Data Review," (Office of Emergency and Remedial Response, US EPA, (EPA-540/R-94/013, February 1994).

Holding Time Periods

The holding times for all parameters are given on Table 3. As indicated by the sample collection and analysis dates on the chain-of-custody forms and the analytical reports provided by Quanterra, all samples were prepared and analyzed within the required holding periods.

Method Blank Samples

Contamination of the samples contributed by laboratory conditions or procedures was monitored by the concurrent preparation and analysis of method blank samples. Methylene chloride was detected in the method blank associated with Prep Batch # 9344171 at 2.7 ug/L. The associated samples were all non-detect for methylene chloride. Methylene chloride is a common laboratory contaminant and is allowed to be present in the method blank up to 5 times the reporting limit (5 ug/L). Iron was detected in the method blank associated with the metals analysis of Prep Batch # 9334120 at .11 ug/L. The associated samples were non-detect for iron. All sample results associated with the above-mentioned method blanks are considered valid.

System Monitoring Compounds/Surrogate Spikes

For organic analysis, laboratory performance on individual samples was monitored by using percent recoveries of system monitoring compounds/surrogate spikes. Table 4 lists the samples that were outside the accepted range for recovery. All samples were considered acceptable based on the criteria for corrective action required by QAPjP or their associated QC being within acceptable limits.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Results

To assess the long-term accuracy and precision of the analytical methods on sample matrices, MS/MSD percent recoveries and relative percent difference (RPD) of the recoveries were determined. Table 5 lists the MS/MSD batches that had percent recoveries outside acceptable limits. Additional QA/QC samples associated with the sample run indicated that the analytical system was operating within control. The exceedences are most likely due to matrix interference. Associated data was not qualified and is considered valid.

Laboratory Control Samples (LCS)

LCS percent recoveries and RPDs were reviewed to assess the overall performance and accuracy of the laboratory procedures. All LCS data were within acceptable limits.

Overall Assessment

The data collected during the months of November and December 1999 exhibited acceptable levels of precision and accuracy and is found to be suitable for all purposes without qualification.

Vernay Laboratories

Yellow Springs, Ohio

Project No. 0109.59.12

The Payne Firm, Inc.

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TABLE 1: Sample Identities

Date	Matrix	ID
Nov-99	Water	CW1/111599
		CW1/111799
		CW1/111999
		MW-5CD/113099
		MW-2/113099
		MW-2CD/113099
		MW-25E/113099
		MW-1/113099
		MW-13/113099
		MW-9/113099
		MW-12/113099
		FB/113099
		TB/113099
		MW-7
		MW-3CD
		MW-8
		MW-3CD
		MW-8
		MW-3
		MW-0206
		MW-0202
Dec-99	Water	ST0205/120299
	Soil	SED0201/120299
	Soil	SED0202/120299
	Water	ST0209/120299
	Soil	SED0203/120299
	Soil	SED0204/120299
	Water	ST0206/120299
	Soil	SED0205/120299
	Water	ST0207/120299
	Soil	SED0206/120299
	Water	860 Dayton St. (A)/120299
	Water	860 Dayton St. (B)/120299
	Water	MW201/120199
	Water	MW203/120199
	Water	MW207/120199
	Water	MW205/120199
	Water	MW204/120199
	Water	MW4CD/120199
	Water	MW4/120199
	Water	TB/1200199
	Water	RIN-1/120199
	Water	MW-6/120199
	Water	MW-10/120199
	Water	MW5/120199
	Water	MW11/120199
	Water	FB/120199
	Water	MW12/120199
	Water	RW-1/120199
	Water	RW-2/120199
	Water	RIN-2/120199
	Water	DUPLICATE/120199
	Water	MW12/120299

Vernay Laboratories, Inc.

Yellow Springs, Ohio

Project No. 0109.59.12

The Payne Firm, Inc.

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TABLE 2: Analytical Parameters and Methods

Parameter	Method
Volatile Organic Compounds	SW846 8260B
Polynuclear Aromatic Hydrocarbons	CFR136A 610
Metals	SW846 6010B
Mercury	SW846 7470A
Hexavalent Chromium	SW846 7196A
pH	MCAWW 150.1
Total Dissolved Solids	MCAWW 160.1
Sulfate	MCAWW 300.0A
Total Hardness	MCAWW 130.2

SW846 "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," Third Edition, November 1986 and its updates.

MCAWW "Methods for Chemical Analysis of Water and Wastes," EPA-600/4-79-020, March 1983 and subsequent revisions.

Vernay Laboratories, Inc.

Yellow Springs, Ohio

Project No. 0109.59.12

The Payne Firm, Inc.

Environmental Consultants

TABLE 3: Holding Times

Method	Constituent	Holding Time
SW846 8260B	VOCs	14 days
CFR136A 610	PAHs	7 days to extract, 28 days to analyze
SW846 6010B	Metals	180 days
SW846 7470A	Mercury	180 days
SW846 7196A	Chromium	24 hrs
MCAWW 160.1	TDS	
MCAWW 300.0A	Sulfate	28 days
MCAWW 130.2	Total Hardness	

TABLE 4: Samples with Surrogate Recoveries Outside Acceptable Limits

VOCs	1,2-Dichloroethane-d4		Toluene-d8		Bromofluorobenzene		Dibromofluoromethane	
	% Recovery	Acceptable Limits	% Recovery	Acceptable Limits	% Recovery	Acceptable Limits	% Recovery	Acceptable Limits
MW207/120199	91	64-140	**74**	84-112	102	75-122	105	77-127
MW204/120199	91	64-140	**83**	84-112	103	75-122	106	77-127
MW-2CD/13099	84	64-140	**83**	84-112	103	75-122	93	77-127

Note: Percent Recoveries in bold are outside acceptable limits.

Vernay Laboratories, Inc.

Yellow Springs, Ohio

Project No. 0109.59.12

The Payne Firm, Inc.

Environmental Consultants

Table 5: MS/MSD Results Outside Acceptable Limits

Batch #	Analyte	% Recovery 1	% Recovery 2	Criteria	RPD	Criteria
9340102	Mercury	**26**	**25**	80-120	3.7	0-20
9343178	1,1-Dichloroethene	**127**	126	75-126	0.57	0-25
	Benzene	**120**	**117**	81-116	1.9	0-18

Note: Percent Recoveries in bold are outside acceptable limits.

MEMORANDUM

The Payne Firm, Inc.
Environmental Consultants

11231 Cornell Park Drive
Cincinnati, Ohio 45242
513-489-2255 Fax: 513-489-2533

TO: Daniel D. Weed, C.P.G

FROM: Mark E. Berkich

DATE: August 17, 2000

SUBJECT: Data Quality Assessment and Validation of Soil and Water Samples Collected During February, April and May of 2000 at the Vernay Laboratory Site

PROJECT NO.: 0109.59.12

The following details an analytical data quality assessment and validation for the samples collected during the months of February, April, and May 2000 from the above-referenced facility. Severn Trent Laboratories (STL) in North Canton, Ohio analyzed the samples identified in Table 1, for a variety of organic and inorganic constituents. The analytical parameters and associated methods are listed on Table 2. The quality assurance criteria used to assess the data were consistent with the relevant guidance in "US EPA Contract Laboratory National Functional Guidelines for Organic Data Review," (EPA-540/R-94/012, February 1994) and "US EPA Contract Laboratory National Functional Guidelines for Inorganic Data Review," (EPA-540/R-94/013, February 1994).

Holding Time Periods

The holding times for all parameters are given in Table 2. As indicated by the samples collection and analysis dates on the chain-of-custody forms and the analytical reports provided by STL-North Canton, all samples were prepared and analyzed within the required holding periods.

Method Blank Samples

Contamination of the samples contributed by laboratory conditions or procedures was monitored by the concurrent preparation and analysis of method blank samples. There were no detections in the method blanks samples associated with this sample set.

System Monitoring Compounds/Surrogate Spikes

For VOCs and PAHs, laboratory performance on individual samples was monitored by using percent recoveries of system monitoring compounds/surrogate spikes. Table 3 lists the samples that had surrogates outside the acceptable limit. All samples were considered acceptable based on their associated QC being within acceptable limits.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Results

To assess the long-term accuracy and precision of the analytical methods on sample matrices, MS/MSD percent recoveries and relative percent difference (RPD) of the recoveries were determined. All MS/MSD results were within range.

Laboratory Control Samples (LCS)

LCS percent recoveries and RPDs were reviewed to assess the overall performance and accuracy of the laboratory procedures. Table 4 lists the LCSs that had analytes (Lindane) outside the acceptable limits. The associated sample results were non-detect for Lindane and are considered valid.

Overall Assessment

The data set referenced in Table 1 exhibited acceptable levels of precision and accuracy and is found to be suitable for all purposes without qualification.

Vernay Laboratories, Inc.
Yellow Springs, Ohio
Project No. 0109.59.12

The Payne Firm, Inc.
Environmental Consultants

TABLE 1: Sample Identities

Date	Matrix	ID
2/21/2000	Soil	GP0181/6-8
		GP0181/14-16
		GP0182/14-16
		GP0182/18-19.5
		GP0183/8-10
		GP0183/14-16
		GP0184/8-10
		GP0184/14-16
		MW14/8-10
		MW14/14-16
		MW14/022100
		GP0185/0-1.5
		GP0186/0-1.5
4/4/2000	Soil	VSGP-1/10-12
		VSGP-1/12-13.5
		VSGP-2/10-11
		VSGP-2/11-13.2
		VSGP-3/3-4
4/5/2000	Soil	VSGP-5/2.5-4
		VSGP-5/12.5-13.3
		VSGP-6/10-12
		VSGP-8/4-6
		VSGP-8/8-10
		VSGP-9/4-6
		VSGP-9/8-10
		VSGP-10/4-6
		VSGP-10/12-14.5
		VSGP-11/4-5
		VSGP-12/4-5
		VSGP-12/12.5-14.5
		VSGP-7/4-6
		VSGP-4/6-9.5

Vernay Laboratories, Inc.

Yellow Springs, Ohio

Project No. 0109.59.12

The Payne Firm, Inc.

Environmental Consultants

TABLE 1: Sample Identities

Date	Matrix	ID
4/6/2000	Water	VSGP-11/040600
		VSGP-9/040600
		VSGP-7/040600
		VSGP-5S/040600
		VSGP-5D/040600
		VSGP-4/040600
		VSGP-3/040600
		VSGP-2/040600
		VSGP-1/040600
		VSGP-13/040600
5/19/2000	Soil	GP0187/0-2
		GP0187/4-6
		GP0187/8-10
		GP0188/0-2
		GP0188/4-6
		GP0188/8-10
		GP0189/0-2
		GP0189/4-6
		GP0189/8-10
		GP0190/0-2
		GP0190/4-6
		GP0190/8-10
		GP0190/14-16
		GP0191/0-2
		GP0191/4-6
		GP0191/8-10
		GP0191/14-16
		GP0192/0-2
		GP0192/4-6
		GP0192/8-10
		GP0192/13.8-14.3
		GP0193/0-2

Vernay Laboratories, Inc.

Yellow Springs, Ohio

Project No. 0109.59.12

The Payne Firm, Inc.

Environmental Consultants

TABLE 1: Sample Identities

Date	Matrix	ID
5/19/2000	Soil	GP0193/4-6
		GP0193/8-10
		GP0193/12-14
5/20/2000	Soil	GP0194/0-2
		GP0194/4-6
		GP0194/8-10
		GP0194/14-16
		GP0195/0-2
		GP0195/4-6
		GP0195/8-10
		GP0195/12-14
		GP0195/16-18
		GP01100/0-2
		GP01100/4-6
		GP01100/8-10
		GP01100/12-14
		GP01101/0-2
		GP01101/4-6
		GP01101/8-10
		GP01101/12-14
		GP01101/16-18
		GP01102/0-2
		GP01102/4-6
		GP01102/8-10
		GP01102/12-14
		GP01103/0-2
		GP01103/4-6
		GP01103/8-10
		GP01103/14-16
5/21/2000	Soil	GP0196/0-2
		GP0196/4-6
		GP0196/8-10

Vernay Laboratories, Inc.

Yellow Springs, Ohio

Project No. 0109.59.12

The Payne Firm, Inc.

Environmental Consultants

TABLE 1: Sample Identities

Date	Matrix	ID
5/21/2000	Soil	GP0196/14-16
		GP0196/15-16.9
		GP0196/18-20
		GP0197/0-2
		GP0197/4-6
		GP0197/8-10
		GP0197/12-14
		GP0197/15.5-16.8
		GP0197/16.8-18
		GP0198/0-2
		GP0198/4-6
		GP0198/8-10
		GP0198/12-14
		GP0198/14.5-16
		GP0198/17.5-20
		GP0198/22-24
		GP0199/0-2
		GP0199/4-6
		GP0199/8-10
		GP0199/12-14
		GP0199/16.2-17.3
		GP01104/0-2
		GP01104/4-6
		GP01104/8-10
		GP01104/12-14
		GP01104/15-17.1
		GP0196/15-16.9
		GP0198/17.5-20
5/22/2000	Soil	GP01105/0-2
		GP01105/4-6
		GP01105/8-10
		GP01105/12-14

Vernay Laboratories, Inc.

Yellow Springs, Ohio

Project No. 0109.59.12

The Payne Firm, Inc.

Environmental Consultants

TABLE 1: Sample Identities

Date	Matrix	ID
5/22/2000	Soil	GP01106/0-2
		GP01106/4-6
		GP01106/8-10
		GP01106/12-14
		GP01107/0-2
		GP01107/4-6
		GP01107/9-10.7
		GP01107/12-14
		GP01108/0-2
		GP01108/4-6
		GP01108/6.5-7.5
		GP01108/8-10
		GP01108/12-14
		GP01107/9-10.7
		GP01108/6.5-7.5

Vernay Laboratories, Inc.
Yellow Springs, Ohio
Project No. 0109.52.12

The Payne Firm, Inc.
Environmental Consultants

TABLE 2: Analytical Methods and Holding Times

Method	Constituent	Holding Time
SW846 8260B	VOCs	14 days
SW846 8310	PAHs	7 days to extract, 28 days to analyze
SW846 6010B	RCRA Metals	180 days
SW846 7470A	Mercury	180 days
SW846 8270C	SVOCs	Solid - 14 days to extract. Liquid - 7 days to extract. Both 40 days after extraction.
SW846 8082	PCBs	Same as SVOCs
SW846 8081	Pesticides	Same as SVOCs
SW846 418.1	TPH	14 days

References:

MCAWW "Methods for Chemical analysis of Water and Wastes", EPA-600/4-79-020, March 1983 and subsequent revisions.

RSK Sample Prep and Calculations for Dissolved Gas Analysis in Water Samples Using a GC Headspace Equilibration Technique, RSKSOP-175, Rev. 0, 8/11/94, USEPA Research Lab.

SW846 "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 and its updates.

Vernay Laboratories, Inc.
Yellow Springs, Ohio
Project No. 0109.59.12

The Payne Firm, Inc.
Environmental Consultants

TABLE 3: Samples with Surrogate Recoveries Outside Acceptable Limits

Sample ID	1,2-Dichloroethane-d4		Toluene-d8		Dibromofluoromethane		4-Bromofluorobenzene	
	% Recovery	Acceptable Limits	% Recovery	Acceptable Limits	% Recovery	Acceptable Limits	% Recovery	Acceptable Limits
VSGP-6/10-12	106	61-130	**146**	60-143	119	59-138	79	47-158
Associated QC Prep Batch #0108230	109	61-130	117	60-143	117	29-138	109	47-158
GP0196/18-20	125	61-130	**160**	60-143	137	59-138	66	47-158
Associated QC Prep Batch #0152179	119	61-130	126	60-143	126	59-138	121	47-158
GP0198/4-6	118	61-130	**148**	60-143	127	59-138	75	47-158
Associated QC Prep Batch #0157164	120	61-130	125	60-143	127	59-138	122	47-158
GP1108/12-14	118	61-130	**144**	60-143	127	59-138	99	47-158
GP01199/0-2	108	61-130	**158**	60-143	123	59-138	73	47-158
Associated QC Prep Batch #153248	116	61-130	128	60-143	124	59-138	124	47-158

Note: Percent Recoveries in bold are outside acceptable limits.

Vernay Laboratories, Inc.
Yellow Springs, Ohio
Project No. 0109.59.12

The Payne Firm, Inc.
Environmental Consultants

TABLE 4: LCS Results Outside Acceptable Limits

Prep Batch	Analyte	% Recovery 1	% Recovery 2	Criteria	RPD	Criteria	Associated Samples
101104	Lindane	57	85	47-130	**39**	0-36	VSGP-5/2.5-4 VSGP-8/4-6
143096	Lindane	89	59	47-130	**41**	0-36	GP0187/4-6 GP0187/8-10 GP0188/4-6 GP-0188/8-10 GP-0189/4-6 GP-0189/8-10

MEMORANDUM

The Payne Firm, Inc.
Environmental Consultants

11231 Cornell Park Drive
Cincinnati, Ohio 45242
513-489-2255 Fax: 513-489-2533

TO: Daniel D. Weed, C.P.G.

FROM: Mark E. Berkich

DATE: August 16, 2000

SUBJECT: Data Quality Assessment and Validation of Ground Water Surface/Storm Water and Sediment Samples Collected from February through June 2000 at the Vernay Laboratory Site

PROJECT NO.: 0109.59.12

The following details an analytical data quality assessment and validation for the samples collected during the period of February through June 2000 from the above-referenced facility. Severn Trent Laboratories (STL) in North Canton, Ohio analyzed the samples identified in Table 1, for a variety of organic and inorganic constituents. The analytical parameters and associated methods are listed on Table 2. The quality assurance criteria used to assess the data were consistent with the relevant guidance in "US EPA Contract Laboratory National Functional Guidelines for Organic Data Review," (EPA-540/R-94/012, February 1994) and "US EPA Contract Laboratory National Functional Guidelines for Inorganic Data Review," (EPA-540/R-94/013, February 1994).

Holding Time Periods

The holding times for all parameters are also given in Table 2. As indicated by the sample collection and analysis dates on the chain-of-custody forms and analytical reports provided by STL, all samples were prepared and analyzed within the required periods.

Method Blank Samples

Contamination of the samples contributed by laboratory conditions or procedures was monitored by the concurrent preparation and analysis of method blank samples. Review of the method blank reports indicated that no contamination occurred from the laboratory methodology.

System Monitoring Compounds/Surrogate Spikes

For organic analysis, laboratory performance on individual samples was monitored by using percent recoveries of system monitoring compounds/surrogate spikes. Table 3 lists the samples that were outside the accepted range for recovery. No corrective action was taken by STL based on the associated QC having its respective surrogates within range. The exceedences were likely due to the matrix effect.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Results

To assess the long-term accuracy and precision of the analytical methods on sample matrices, MS/MSD percent recoveries and relative percent difference (RPD) of the recoveries were determined. All MS/MSD and RPDs were within acceptable limits.

Laboratory Control Samples (LCS)

LCS percent recoveries and RPDs were reviewed to assess the overall performance and accuracy of the laboratory procedures. The LCS duplicate recovery for Aroclor 1016 was out of range for batch 0160097. All associated samples were non-detect. No corrective action was required. All remaining LCS data were within acceptable limits.

Field QA/QC

Two equipment rinsate samples (Rin1/060600 and Rin2/060600) were analyzed in conjunction with the samples. These field QA/QC samples were designed to identify the presence of contamination resulting from sample collection and handling procedures in the field and during shipment. The rinsate samples were analyzed for VOCs, PAHs, and RCRA Metals. Rin1/060600 had a detection of selenium at the reporting limit (0.005 mg/L). Associated samples were not qualified due to non-detect results for selenium.

Two field blanks and two trip blanks were analyzed in conjunction with the sample set. The field blank and trip blank collected on June 6, 2000 each had a detection of methylene chloride at 1.5 mg/L. Methylene chloride is a common laboratory contaminant. The associated data set did not require qualification.

Overall Assessment

The data collected in the months of February through June 2000 exhibited acceptable levels of precision and accuracy and is found to be suitable for all purposes without qualification.

Vernay Laboratories, Inc.

Yellow Springs, Ohio

Project No. 0109.59.12

The Payne Firm, Inc.

Environmental Consultants

TABLE 1: Sample Identities

Date	Matrix	ID
2/17/2000	Water	STW-1/021700
		STW-2/021700
		STW-3/021700
		STW-4/021700
		STW-6/021700
		STW-7/021700
		MW13/021700
3/23/2000	Water	MW-13/032300
		STW-1/032300
		STW-2/032300
		STW-3/032300
		STW-4/032300
		STW-5/032300
		STW-6/032300
		STW-7/032300
4/25/2000	Water	MW-13/042500
		STW-1/042500
		STW-2/042500
		STW-3/042500
		STW-4/042500
		STW-5/042500
		STW-6/042500
		STW-7/042500
6/5/2000	Water	MW12/060500
		MW1/060500
		MW2SE/060500
		MW8/060500
		MW2CD/060500
		MW2/060500
		MW6/060500
		MW7/060500

Vernay Laboratories, Inc.

Yellow Springs, Ohio

Project No. 0109.59.12

The Payne Firm, Inc.

Environmental Consultants

TABLE 1: Sample Identities

Date	Matrix	ID
6/6/2000	Water	MW12/060600
		MW3/060600
		MW0201/060600
		MW9/060600
		MW11/060600
		MW13/060600
		MW10/060600
		MW4/060600
		MW5CD/060600
		MW0202/060600
6/7/2000	Water	MW0203/060700
		MW0204/060700
		MW0205/060700
		MW0206/060700
		MW0207/060700
		MW14/060700
		MW4CD/060700
		ST0203/060700
		ST0205/060700
		ST0209/060700
		ST0206/060700
		ST0207/060700
		ST0101/060700
		ST0102/060700
		ST0103/060700
		ST0105/060700
		ST0107/060700
	Sediment	SED0201/060700
		SED0202/060700
		SED0203/060700
		SED0204/060700
		SED0205/060700
		SED0206/060700
6/8/2000	Water	MW0205/060800
7/18/2000	Water	Utility Tunnel Sump

TABLE 2: Analytical Methods and Holding Times

Method	Constituent	Holding Time
SW846 8260B	VOCs	14 days
SW846 8310	PAHs	7 days to extract, 28 days to analyze
SW846 6010B	RCRA Metals	180 days
SW846 7470A	Mercury	180 days
SW846 8270C	SVOCs	Solid - 14 days to extract. Liquid - 7 days to extract. Both 40 days after extraction.
SW846 8082	PCBs	Same as SVOCs
SW846 8081	Pesticides	Same as SVOCs
SW846 8151	Herbicides	Same as SVOCs
MCAWW 310.1	Alkalinity	7 days
MCAWW 300.0A	Chloride	28 days
RSK SOP-175	Diss. Gases	7 days
MCAWW 476.1	Nitrate	48 hrs
MCAWW 415.1	TOC	28 days

References:

MCAWW - "Methods for Chemical analysis of Water and Wastes", EPA-600/4-79-020, March 1983 and subsequent revisions.

RSK - Sample Prep and Calculations for Dissolved Gas Analysis in Water Samples Using a GC Headspace Equilibration Technique, RSKSOP-175, Rev. 0, 8/11/94, USEPA Research Lab.

SW846 - "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 and its updates.

TABLE 3: Samples with Surrogate Recoveries Outside Acceptable Limits

Sample ID	1,2-Dichloroethane-d4		Toluene-d8		Dibromofluoromethane		4-Bromofluorobenzene	
	% Recovery	Acceptable Limits	% Recovery	Acceptable Limits	% Recovery	Acceptable Limits	% Recovery	Acceptable Limits
STW-6/032300	**53**	61-128	**115**	76-110	**63**	73-122	109	74-116
STW-7/032300	**57**	61-128	**112**	76-110	**67**	73-122	110	74-116
Associated QC Prep Batch #0090141	91	61-128	100	76-110	94	73-122	106	74-116

Note: Percent Recoveries in bold are outside acceptable limits.

MEMORANDUM

The Payne Firm, Inc.
Environmental Consultants

11231 Cornell Park Drive
Cincinnati, Ohio 45242
513-489-2255 Fax: 513-489-2533

TO: David C. Contant

FROM: Mark E. Berkich

DATE: January 11, 2002

SUBJECT: Data Quality Assessment and Validation for Ground Water, Surface Water, and Sediment Samples Collected at and in the Vicinity of Vernay Laboratories in Yellow Springs, Ohio

ROJECT NO.: 0109.59.11

This memorandum details an analytical data quality assessment and validation for the ground water, surface water, and sediment samples collected in November 2000, June 2001, and November 2001 from and in the vicinity of the above-referenced facility. Severn Trent Laboratories (STL) located in North Canton, Ohio analyzed the samples identified in Table 1 for volatile organic compounds (VOCs) by Method 8260B.

The quality assurance criteria used to assess the data were established by *US EPA Contract Laboratory Program National Functional Guidelines for Organic Review*, EPA-540/R-94/012, February 1994 (Organic Review Guidance).

HOLDING TIMES

As indicated by the sample collection and analysis dates on the chain-of-custody forms and the analytical reports provided by STL, all samples were prepared and analyzed within the required holding times. MW-4/110200, MW-4CD/110200, MW-13/110200, and Duplicate/110200 were diluted and re-analyzed past the holding times. Their respective results were consistent with the original analysis within the holding time.

METHOD BLANK SAMPLES

ontamination of the samples contributed by laboratory conditions or procedures was monitored by the oncurrent preparation and analysis of method blank samples. The method blank associated with rep Batch No. 133151 had a detection of methylene chloride at 1.6 milligram per liter (mg/L). Methylene chloride is a common laboratory contaminant and, according to the Organic Review Guidance, is allowed to be present at five times the reporting limit. The reporting limit for methylene chloride is 1.0 mg/L; therefore, the remaining method blank samples were reported to be free of detectable concentrations of target analytes - indicating no significant laboratory contamination occurred.

SYSTEM MONITORING COMPOUNDS/SURROGATE SPIKES

Laboratory performance on individual samples for the organic analyses was monitored by using percent recoveries of system monitoring compounds/surrogate spikes. All surrogate recoveries associated with the sample analysis met the acceptance criteria.

MATRIX SPIKE/MATRIX SPIKE DUPLICATE RESULTS

To assess the long-term accuracy and precision of the analytical methods on sample matrices, matrix spike/matrix spike duplicate (MS/MSD) percent recoveries and the relative percent differences (RPD) of the recoveries were determined. Samples SE0202/060701, SED0203/060701, SED0204/060701, and SED0201/111901 had associated MS/MSD internal standards outside acceptance limits. A review of the corresponding laboratory control samples indicated acceptable results; thus, the samples were not qualified and are considered acceptable. The MS/MSD failure is likely due to matrix interference. The remaining MS/MSD and RPD data associated with the sample sets were within acceptable limits.

LABORATORY CONTROL SAMPLE

Laboratory Control Samples (LCSs) were examined to assess the overall performance and the accuracy of the laboratory procedures. All LCSs were within acceptable limits.

FIELD QUALITY ASSURANCE AND QUALITY CONTROL

The field quality assurance and quality control (QA/QC) samples collected consisted of two field blanks, five rinsates, three trip blanks, and four duplicates (Table 2). All blank samples (field and trip) were non-detect. Select rinsate samples had detectable concentrations of VOCs. Rinsate/060801 (Lot No. A1F110144) had a detection of tetrachloroethene at 2.0 micrograms per liter (ug/L) and Rinsate/111901 (Lot No. A1K210224) had a detection of chloroform at 21 ug/L. Table 3 summarizes the duplicate results. All QA/QC results were considered acceptable.

OVERALL ASSESSMENT

The ground water, surface water, and sediment data collected during November 2000, June 2001, and November 2001 at and in the vicinity of Vernay Laboratories, Inc. (Vernay) facility in Yellow Springs, Ohio exhibited acceptable levels of precision and accuracy and is considered acceptable.

Thompson Hine, LLP

Dayton, Ohio

Project No. 0109.59.11

The Payne Firm, Inc.

Environmental Consultants

TABLE 1: Samples Validated

Sample	Date	Lot Number	Matrix
MW8/110100	11/1/2001	A0K020273	Water
MW-3/110100			
MW3CD/110100			
MW0201/110100			
MW0202/110100			
MW0203/110100			
MW0204/110100			
MW0205/110100			
MW0205/110100			
MW0206/110100			
MW0207/110100			
MW9/110100			
MW10/110100			
MW-4/110200	11/2/2000		
MW-4CD/110200			
MW-13/110200			
MW-5/110200			
MW-CD/110200			
ST-207/110200		A0K030132	
ST-206/110200			
ST-0209/110200			
ST-0205/110200			
SED-0206/110200		A0K030177	Sediment
SED-0205/110200			
SED-0204/110200			
SED-0203/110200			
SED-0202/110200			
SED-0201/110200			
ST0203/060701	6/7/2001	A1F110172	Water
ST0205/060701			
ST0209/060701			
ST0206/060701			
ST0207/060701			

TABLE 1: Samples Validated

Sample	Date	Lot Number	Matrix
SED0201/060701	6/7/2001	A1F110172	Sediment
SED0202/060701			
SED0203/060701			
SED0204/060701			
SED0205/060701			
SED0206/060701			
MW2/060701			Water
MW3/060701			
MW3CD/060701			
MW0204/060701			
MW0205/060701			
MW0206/060701			
MW0207/060701			
MW8/060701			
MW-0201/060801	6/8/2001	A1F110144	Water
MW-0202/060801			
MW-0203/060801			
MW-2CD/060801			
MW-11/060801			
MW-10/060801			
MW-4/060801			
MW-4CD/060801			
MW-13/060801			
MW-9/060801			
MW-5CD/060801			
MW-5/060801			
MW-12/060801			
MW-5/060801			
MW-12/060801			
RW-5/060801			
860 Dayton St. (A)/060801			
860 Dayton St. (B)/060801			
SED0201/111901	11/19/2001	A1L030135	Sediment
SED-0205/111901			Water
ST0205/111901			
ST0203/111901			
ST0206/111901			
MW7/111901		A1K210224	
MW1/111901			
MW5/111901			
MW5CD/111901			
MW13/111901			
MW10/111901			

TABLE 1: Samples Validated

Sample	Date	Lot Number	Matrix
MW4/111901	11/19/2001	A1K210224	Water
MW4CDE/111901			
MW0201/112001	11/20/2001	A1K210225	
MW0202/112001			
MW0203/112001			
MW0204/112001			
MW0205/112001			
MW0206/112001			
MW0207/112001			
860A/112001			
860B/112001			

TABLE 2: QA/QC Samples

Sample	Lot Number
Rinsate 01/110200	A0K020273
Rinsate 02/110200	
Field Blank/110200	
Duplicate/110200	
Duplicate/111901	A1K210224
Rinsate/111901	
Field Blank/111901	
Trip Blank/111901	
Duplicate/060801	A1F110144
Rinsate/060801	
Duplicate 01/060801	
Rinsate 01/060801	
Trip Blank/060801	
Trip Blank/060701	A1F110172

TABLE 3: Duplicate Comparisons

Chemical	Lot # A0K020273		Lot # A1F110144			
	Duplicate /110200	MW-4/110200	Duplicate 01/060801	MW-5/060801	Duplicate/060801	MW-4/060801
Tetrachloroethene	3200	2900	3.2	2.8	1000	850
Trichloroethene	130	120	1.6	1.5	74	66
1,1,2-T-1,2,2-T	3900	3500				
1,2-Dichloropropane						
1,2 -Dichloroethane-cis					56	55
1,2-Dichloroethane (total)					56	55

Chemical	Lot # A1K210224	
	Duplicate/111901	MW13/111901
Tetrachloroethene	1600	1300
Trichloroethene		
1,1,2-T-1,2,2-T		
1,2-Dichloropropane		
1,2 -Dichloroethane-cis	63	61
1,2-Dichloroethane (total)	63	61

Results in ug/L

APPENDIX VI

TABLE 10 OF THE CURRENT CONDITIONS REPORT

TABLE 10: Analytical Support Levels

Support Level	Description	Data Analyses
I	Qualitative Field Analysis: This level is characterized by the use of portable instruments or other equipment that can provide real-time qualitative data to assist in the optimization of sampling point locations and in providing health and safety support.	• Field headspace organic vapor analyses. • Field ground water parameter measurements. • Ground water elevation measurements. • Pumping tests.
II	Qualitative and Semi-Qualitative: This level may include the use of more sophisticated screening techniques, such as portable analytical instruments. Depending upon the types of contaminants, sample matrix, and QC checks applied, qualitative and quantitative data can be obtained.	• Ground water samples collected from Geoprobe soil borings or temporary wells.
III	Quantitative with Fully Defined QA/QC: Laboratory analyses generated with full QA/QC checks of types and frequencies typically specified for ASL IV. The data package does not contain raw instrument output, but does include summaries of QA/QC sample results. Laboratories are required to retain, in the project file, raw instrument data to upgrade ASL III reports to ASL IV when needed. ASL III data was used to characterize of contaminant nature, extent, fate and migration, and risk.	• Soil, surface water, air, and sediment sampling results. • Ground water sampling results from monitoring wells.
IV	Conformational with Complete QA/QC and Reporting: Provides data generated with a full complement of QA/QC checks of specified types and frequencies according to specified analytical protocols for the chemical parameters. The data package includes raw instrument output for validation. These data may be used to confirm data gathered at ASLs II and III, and when full validation of raw data is required.	• No field or laboratory analyses were conducted using ASL IV.
V	Non-Standard: Analyses by non-standard protocols that often require method development or validation (e.g. when extracting detection limits or analysis of an unusual chemical compound is required). New methods may be developed for ASL V data to allow for parameters or matrices that cannot be analyzed by existing standard methods.	• Geotechnical data.

APPENDIX VII

GROUND WATER DATA COMPARISON

APPENDIX VII

COMPARISON OF OHIO VAP INVESTIGATION GROUND WATER DATA AND RCRA CORRECTIVE ACTION DATA

The Ohio VAP investigation ground water analytical data were compared to the RCRA Corrective Action ground water laboratory data. The purpose of this comparison was to: 1) determine if there is significant variability in the laboratory method reporting limits; and 2) determine if there is significant variability in the sample concentrations between the historic data and the recent data. The empirical methods for comparing confirmatory data with historical data presented in US EPA guidance (US EPA, 1998) were used.

The confirmatory data that was used for these comparisons included ground water laboratory data collected during the quarterly ground water monitoring events for 2003. This data is appropriate for use as confirmatory data since the data was collected in conformance with the Project QAPP (Payne Firm, 2003). The confirmatory ground water samples were collected from the same locations as the Ohio VAP investigation data.

The Ohio VAP investigation ground water data collected from the Facility consisted of seven semi-annual ground water sampling events conducted between November 1998 and November 2001. These ground water sampling events were conducted as part of the Ohio VAP investigation at the Facility. A summary of these sampling events, as well as the analytical laboratory results was presented in the CCR (Payne Firm, 2002). The monitoring well network in place during this period included a total of 27 monitoring wells (20 on the Facility property, and 7 off of the property).

A ground water capture system is currently operating at the Facility. This ground water capture system includes two pumping wells along the eastern portion of the Facility's property. The southernmost pumping well has been in operation since March 2000, and the northernmost pumping well has been in operation since January 2003. Because of the change in hydraulic gradients and contaminant movement caused by the effects of pumping from the capture wells, the monitoring wells most affected by the ground water interim measure were not used for the comparison. The monitoring wells that were used in this comparison are presented on Tables 1 and 2 of this appendix, and include the following 17 monitoring well locations: MW01-01, MW01-02, MW01-02CD, MW01-02SE, MW01-03, MW01-03CD, MW01-06, MW01-07, MW01-11, MW01-12, and MW02-01 through MW02-07.

The comparisons of the Ohio VAP investigation data to the confirmatory data was conducted for all constituents identified in the Project QAPP and in the Technical Memorandum No. 1 (Payne Firm, 2003). These include the following parameter groups: VOCs, SVOCs, and metals (chromium, copper, and zinc). Some constituents were not analyzed during the Ohio VAP investigation ground water sampling events, and were therefore not assessed during this comparison. The VOCs that were not analyzed during the Ohio VAP investigation ground water sampling events include: 1,2,4-trichlorobenzene;

Appendix VII (cont.)

1,2-dibromo-3-chloropropane; 1,2-dibromoethane; 1,2-dichlorobenzene; 1,3-dichlorobenzene; 1,4-dichlorobenzene; cyclohexane; dichlorodifluoromethane; isopropylbenzene; methyl acetate; methyl tert-butyl ether; methylcyclohexane; and trichlorofluoromethane. The SVOCs that were not analyzed during Ohio VAP investigation ground water sampling events include: 1,1-biphenyl; acetophenone; atrizine; benzaldehyde; and caprolactam. Metals that were not analyzed during the Ohio VAP investigation ground water sampling events include copper and zinc.

Laboratory Method Reporting Limits Comparability

The variability of the laboratory method reporting limits (MRLs) between the Ohio VAP investigation data and confirmatory data was assessed. This assessment was conducted by comparing the ratio of the MRLs of the Ohio VAP investigation data with that of the confirmatory data. For the purpose of this comparison, the maximum MRLs were determined for each constituent from the Ohio VAP investigation ground water sampling events. The minimum MRLs from the confirmatory ground water data were also determined. The maximum Ohio VAP MRLs were then compared to the minimum confirmatory MRLs by determining the ratio of the Ohio VAP MRLs to the confirmatory MRLs. Ratios greater than 2 were assigned an index value of "0", and ratios equal to or less than 2 were assigned an index value of "1". A summary of this comparison is presented on Tables 1 and 2 of this appendix.

A comparison of the number of locations and constituents having an index of 1 to those having an index of 0 was conducted. For the VOCs, 14 monitoring well locations (82%) have an index of 1, and 3 well locations (18%) have an index of 0. The VOCs that were assigned an index value of 0 included: bromomethane; chloroethane; chloromethane; and vinyl chloride. For the SVOCs and chromium, all locations (100%) have an index of 1. Since more than 80% of the values were assigned an index of 1, the Ohio VAP data and the confirmation data sets have basically the same MDL.

Data Comparability and Confirmation

Since the MRLs for the Ohio VAP investigation ground water data and confirmatory data are considered acceptable, a comparison of the reported hazardous constituent concentrations obtained in the Ohio VAP investigation ground water data to those of the confirmatory data was conducted. Three Ohio VAP investigation ground water sampling events from the Spring 1999, Spring 2000, and Fall 2001 were each compared separately to the first quarter 2003 RCRA Corrective Action ground water sampling event. The first quarter 2003 ground water sampling event was considered as the confirmatory data set for this comparison since the entire list of constituents of concern (VOCs, SVOCs, and metals) were analyzed during this event.

For each hazardous constituent of concern, the ratio of the concentration from the Ohio VAP investigation data to the concentration from the confirmatory data was determined. The reporting limit was used if a constituent was not detected by the laboratory (US EPA, 1998). If the ratio was determined to be between 0.1 and 10, then an index value of "1" was assigned to the location/constituent. If the ratio was determined to be either greater than 10 or less than 0.1, then an index value of "0" was assigned to the location/constituent. A summary of this comparison is presented on Tables 3 and 4 of this appendix.

A comparison of the number of locations/constituents having an index of 1 to those having an index of 0 was conducted. For the VOCs, all monitoring wells and constituents have an index value of 1, except for toluene at well MW01-02CD (1999/2003 comparison). For the SVOCs, all monitoring wells (100%) and constituents have an index value of 1. For chromium, all monitoring wells have an index value of 1, except for the 1999/2003 comparison at MW01-03. Since greater than 75% of the data points have an index of 1, the Ohio VAP ground water data results are comparable with the confirmatory ground water results.

Summary

The methods for comparing the Ohio VAP investigation data and confirmatory ground water data were conducted following US EPA guidance (US EPA, 1998). The results of this assessment clearly indicate that there is no significant variability between the MDLs and in the sample concentrations between the Ohio VAP investigation ground water data and the confirmatory ground water data.

The Payne Firm, Inc.

Vernay Laboratories, Inc.

Plant 2/3 Facility

Project No. 0292.11.25

TABLE 1: Method Reporting Limit Comparison - VOCs

ANALYTE	MW01-01		Ratio	Index Value	MW01-02		Ratio	Index Value	MW01-02CD		Ratio	Index Value	MW01-02SE		Ratio	Index Value	MW01-03		Ratio	Index Value	MW01-03CD		Ratio	Index Value
	Pre2003	2003			Pre2003	2003			Pre2003	2003			Pre2003	2003			Pre2003	2003			Pre2003	2003		
1,1,1-TRICHLOROETHANE	1	1	1	1	25	20	1.25	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1,1,2,2-TETRACHLOROETHANE	1	1	1	1	25	20	1.25	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	1	1	1	1	1	20	0.05	1	1	1	1	1	NA	1	NA	NA	1	1	1	1	1	1	1	1
1,1,2-TRICHLOROETHANE	1	1	1	1	25	20	1.25	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1,1-DICHLOROETHANE	1	1	1	1	25	20	1.25	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1,1-DICHLOROETHENE	1	1	1	1	25	20	1.25	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1,2-DICHLOROETHANE	1	1	1	1	25	20	1.25	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1,2-DICHLOROPROPANE	1	1	1	1	25	20	1.25	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2-BUTANONE	10	10	1	1	250	200	1.25	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1
2-HEXANONE	10	10	1	1	250	200	1.25	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1
4-METHYL-2-PENTANONE	10	10	1	1	250	200	1.25	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1
ACETONE	10	10	1	1	250	200	1.25	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1
BENZENE	1	1	1	1	25	20	1.25	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
BROMODICHLOROMETHANE	1	1	1	1	25	20	1.25	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
BROMOFORM	1	1	1	1	25	20	1.25	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
BROMOMETHANE	2	1	2	1	50	20	**2.5**	**0**	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1
CARBON DISULFIDE	1	1	1	1	25	20	1.25	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
CARBON TETRACHLORIDE	1	1	1	1	25	20	1.25	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
CHLOROBENZENE	1	1	1	1	25	20	1.25	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
CHLOROETHANE	2	1	2	1	50	20	**2.5**	**0**	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1
CHLOROFORM	1	1	1	1	25	20	1.25	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
CHLOROMETHANE	2	1	2	1	50	20	**2.5**	**0**	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1
CIS-1,2-DICHLOROETHENE	0.5	0.5	1	1	12	10	1.2	1	0.5	0.5	1	1	0.5	0.5	1	1	0.5	0.5	1	1	0.5	0.5	1	1
CIS-1,3-DICHLOROPROPENE	1	1	1	1	25	20	1.25	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
DIBROMOCHLOROMETHANE	1	1	1	1	25	20	1.25	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
ETHYLBENZENE	1	1	1	1	25	20	1.25	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
METHYLENE CHLORIDE	1	1	1	1	25	20	1.25	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
STYRENE	1	1	1	1	25	20	1.25	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
TETRACHLOROETHENE	1	1	1	1	25	20	1.25	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
TOLUENE	1	1	1	1	25	20	1.25	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
TRANS-1,2-DICHLOROETHENE	0.5	0.5	1	1	12	10	1.2	1	0.5	0.5	1	1	0.5	0.5	1	1	0.5	0.5	1	1	0.5	0.5	1	1
TRANS-1,3-DICHLOROPROPENE	1	1	1	1	25	20	1.25	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
TRICHLOROETHENE	1	1	1	1	25	20	1.25	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
VINYL CHLORIDE	2	1	2	1	50	20	**2.5**	**0**	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1
XYLENES (TOTAL)	1	1	1	1	25	20	1.25	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

BOLD indicates an Index Value of 0

The Payne Firm, Inc.

TABLE 1: Method Reporting Limit Comparison - VOCs

ANALYTE	MW01-06		Ratio	Index Value	MW01-07		Ratio	Index Value	MW01-08		Ratio	Index Value	MW01-11		Ratio	Index Value	MW01-12		Ratio	Index Value	MW02-01		Ratio	Index Value
	Pre2003	2003			Pre2003	2003			Pre2003	2003			Pre2003	2003			Pre2003	2003			Pre2003	2003		
1,1,1-TRICHLOROETHANE	62	40	1.55	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1,1,2,2-TETRACHLOROETHANE	62	40	1.55	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	NA	40	NA	NA	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1,1,2-TRICHLOROETHANE	62	40	1.55	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1,1-DICHLOROETHANE	62	40	1.55	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1,1-DICHLOROETHENE	62	40	1.55	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1,2-DICHLOROETHANE	62	40	1.55	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1,2-DICHLOROPROPANE	62	40	1.55	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2-BUTANONE	620	400	1.55	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1
2-HEXANONE	620	400	1.55	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1
4-METHYL-2-PENTANONE	620	400	1.55	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1
ACETONE	620	400	1.55	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1
BENZENE	62	40	1.55	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
BROMODICHLOROMETHANE	62	40	1.55	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
BROMOFORM	62	40	1.55	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
BROMOMETHANE	120	40	**3**	**0**	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1
CARBON DISULFIDE	62	40	1.55	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
CARBON TETRACHLORIDE	62	40	1.55	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
CHLOROBENZENE	62	40	1.55	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
CHLOROETHANE	120	40	**3**	**0**	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1
CHLOROFORM	62	40	1.55	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
CHLOROMETHANE	120	40	**3**	**0**	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1
CIS-1,2-DICHLOROETHENE	31	20	1.55	1	0.5	0.5	1	1	0.5	0.5	1	1	0.5	0.5	1	1	0.5	0.5	1	1	0.5	0.5	1	1
CIS-1,3-DICHLOROPROPENE	62	40	1.55	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
DIBROMOCHLOROMETHANE	62	40	1.55	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
ETHYLBENZENE	62	40	1.55	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
METHYLENE CHLORIDE	62	40	1.55	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
STYRENE	62	40	1.55	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
TETRACHLOROETHENE	62	40	1.55	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
TOLUENE	62	40	1.55	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
TRANS-1,2-DICHLOROETHENE	31	20	1.55	1	0.5	0.5	1	1	0.5	0.5	1	1	0.5	0.5	1	1	0.5	0.5	1	1	0.5	0.5	1	1
TRANS-1,3-DICHLOROPROPENE	62	40	1.55	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
TRICHLOROETHENE	62	40	1.55	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
VINYL CHLORIDE	120	40	**3**	**0**	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1
XYLENES (TOTAL)	62	40	1.55	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

BOLD indicates an Index Value of 0

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TABLE 1: Method Reporting Limit Comparison - VOCs

ANALYTE	MW02-02		Ratio	Index Value	MW02-03		Ratio	Index Value	MW02-04		Ratio	Index Value	MW02-05		Ratio	Index Value	MW02-06		Ratio	Index Value	MW02-07		Ratio	Index Value
	Pre2003	2003			Pre2003	2003			Pre2003	2003			Pre2003	2003			Pre2003	2003			Pre2003	2003		
1,1,1-TRICHLOROETHANE	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2.5	2	1.25	1	1	1	1	1
1,1,2,2-TETRACHLOROETHANE	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2.5	2	1.25	1	1	1	1	1
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2.5	2	1.25	1	1	1	1	1
1,1,2-TRICHLOROETHANE	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2.5	2	1.25	1	1	1	1	1
1,1-DICHLOROETHANE	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2.5	2	1.25	1	1	1	1	1
1,1-DICHLOROETHENE	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2.5	2	1.25	1	1	1	1	1
1,2-DICHLOROETHANE	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2.5	2	1.25	1	1	1	1	1
1,2-DICHLOROPROPANE	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2.5	2	1.25	1	1	1	1	1
2-BUTANONE	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	25	20	1.25	1	10	10	1	1
2-HEXANONE	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	25	20	1.25	1	10	10	1	1
4-METHYL-2-PENTANONE	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	12	20	0.6	1	10	10	1	1
ACETONE	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	25	20	1.25	1	10	10	1	1
BENZENE	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2.5	2	1.25	1	1	1	1	1
BROMODICHLOROMETHANE	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2.5	2	1.25	1	1	1	1	1
BROMOFORM	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2.5	2	1.25	1	1	1	1	1
BROMOMETHANE	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	5	2	**2.5**	**0**	2	1	2	1
CARBON DISULFIDE	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2.5	2	1.25	1	1	1	1	1
CARBON TETRACHLORIDE	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2.5	2	1.25	1	1	1	1	1
CHLOROBENZENE	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2.5	2	1.25	1	1	1	1	1
CHLOROETHANE	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	5	2	**2.5**	**0**	2	1	2	1
CHLOROFORM	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2.5	2	1.25	1	1	1	1	1
CHLOROMETHANE	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	5	2	**2.5**	**0**	2	1	2	1
CIS-1,2-DICHLOROETHENE	0.5	0.5	1	1	0.5	0.5	1	1	0.5	0.5	1	1	0.5	0.5	1	1	1.2	1	1.2	1	0.5	0.5	1	1
CIS-1,3-DICHLOROPROPENE	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2.5	2	1.25	1	1	1	1	1
DIBROMOCHLOROMETHANE	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2.5	2	1.25	1	1	1	1	1
ETHYLBENZENE	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2.5	2	1.25	1	1	1	1	1
METHYLENE CHLORIDE	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2.5	2	1.25	1	1	1	1	1
STYRENE	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2.5	2	1.25	1	1	1	1	1
TETRACHLOROETHENE	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2.5	2	1.25	1	1	1	1	1
TOLUENE	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2.5	2	1.25	1	1	1	1	1
TRANS-1,2-DICHLOROETHENE	0.5	0.5	1	1	0.5	0.5	1	1	0.5	0.5	1	1	0.5	0.5	1	1	1.2	1	1.2	1	0.5	0.5	1	1
TRANS-1,3-DICHLOROPROPENE	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2.5	2	1.25	1	1	1	1	1
TRICHLOROETHENE	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2.5	2	1.25	1	1	1	1	1
VINYL CHLORIDE	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	5	2	**2.5**	**0**	2	1	2	1
XYLENES (TOTAL)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2.5	2	1.25	1	1	1	1	1

BOLD indicates an Index Value of 0

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TABLE 2: Method Reporting Limit Comparison--SVOCs and Chromium

ANALYTE	UNITS	MW01-04		Ratio	Index Value	MW01-05		Ratio	Index Value	MW01-06		Ratio	Index Value	MW01-07		Ratio	Index Value	MW01-09		Ratio	Index Value	MW01-10		Ratio	Index Value	MW01-11		Ratio	Index Value	MW01-13		Ratio	Index Value
		pre2003	2003			pre2003	2003			pre2003	2003			pre2003	2003			pre2003	2003			pre2003	2003			pre2003	2003			pre2003	2003		
CHROMIUM	MG/L	0.01	0.01	1	1	0.01	0.01	1	1	0.01	0.01	1	1	0.01	0.01	1	1	0.01	0.01	1	1	0.01	0.01	1	1	0.01	0.01	1	1	0.01	0.005	2	1
2,2'-OXYBIS(1-CHLOROPROPANE)	UG/L	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1
2,4,5-TRICHLOROPHENOL	UG/L	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1
2,4,6-TRICHLOROPHENOL	UG/L	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1
2,4-DICHLOROPHENOL	UG/L	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1
2,4-DIMETHYLPHENOL	UG/L	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1
2,4-DINITROPHENOL	UG/L	50	50	1	1	50	50	1	1	50	50	1	1	50	50	1	1	50	50	1	1	50	50	1	1	50	50	1	1	50	50	1	1
2,4-DINITROTOLUENE	UG/L	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1
2,6-DINITROTOLUENE	UG/L	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1
2-CHLORONAPHTHALENE	UG/L	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1
2-CHLOROPHENOL	UG/L	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1
2-METHYLNAPHTHALENE	UG/L	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1
2-METHYLPHENOL	UG/L	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1
2-NITROANILINE	UG/L	50	50	1	1	50	50	1	1	50	50	1	1	50	50	1	1	50	50	1	1	50	50	1	1	50	50	1	1	50	50	1	1
2-NITROPHENOL	UG/L	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1
3,3'-DICHLOROBENZIDINE	UG/L	50	50	1	1	50	50	1	1	50	50	1	1	50	50	1	1	50	50	1	1	50	50	1	1	50	50	1	1	50	50	1	1
3-NITROANILINE	UG/L	50	50	1	1	50	50	1	1	50	50	1	1	50	50	1	1	50	50	1	1	50	50	1	1	50	50	1	1	50	50	1	1
4,6-DINITRO-2-METHYLPHENOL	UG/L	50	50	1	1	50	50	1	1	50	50	1	1	50	50	1	1	50	50	1	1	50	50	1	1	50	50	1	1	50	50	1	1
4-BROMOPHENYL PHENYL ETHER	UG/L	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1
4-CHLORO-3-METHYLPHENOL	UG/L	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1
4-CHLOROANILINE	UG/L	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1
4-CHLOROPHENYL PHENYL ETHER	UG/L	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1
4-METHYLPHENOL	UG/L	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1
4-NITROANILINE	UG/L	50	50	1	1	50	50	1	1	50	50	1	1	50	50	1	1	50	50	1	1	50	50	1	1	50	50	1	1	50	50	1	1
4-NITROPHENOL	UG/L	50	50	1	1	50	50	1	1	50	50	1	1	50	50	1	1	50	50	1	1	50	50	1	1	50	50	1	1	50	50	1	1
ACENAPHTHENE	UG/L	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1
ACENAPHTHYLENE	UG/L	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1
ANTHRACENE	UG/L	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1
BENZO(A)ANTHRACENE	UG/L	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1
BENZO(A)PYRENE	UG/L	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1
BENZO(B)FLUORANTHENE	UG/L	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1
BENZO(GHI)PERYLENE	UG/L	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1
BENZO(K)FLUORANTHENE	UG/L	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1
BIS(2-CHLOROETHOXY)METHANE	UG/L	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1
BIS(2-CHLOROETHYL) ETHER	UG/L	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1
BIS(2-ETHYLHEXYL) PHTHALATE	UG/L	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1
BUTYL BENZYL PHTHALATE	UG/L	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1
CARBAZOLE	UG/L	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1
CHRYSENE	UG/L	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1
DIBENZ(A,H)ANTHRACENE	UG/L	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1
DIBENZOFURAN	UG/L	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1
DIETHYL PHTHALATE	UG/L	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1
DIMETHYL PHTHALATE	UG/L	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1
DI-N-BUTYL PHTHALATE	UG/L	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1
DI-N-OCTYL PHTHALATE	UG/L	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1
FLUORANTHENE	UG/L	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1
FLUORENE	UG/L	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1
HEXACHLOROBENZENE	UG/L	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1
HEXACHLOROBUTADIENE	UG/L	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1
HEXACHLOROCYCLOPENTADIENE	UG/L	50	50	1	1	50	50	1	1	50	50	1	1	50	50	1	1	50	50	1	1	50	50	1	1	50	50	1	1	50	50	1	1
HEXACHLOROETHANE	UG/L	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1
INDENO(1,2,3-CD)PYRENE	UG/L	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1
ISOPHORONE	UG/L	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1
NAPHTHALENE	UG/L	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1
NITROBENZENE	UG/L	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1
N-NITROSODI-N-PROPYLAMINE	UG/L	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1
N-NITROSODIPHENYLAMINE	UG/L	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1
PENTACHLOROPHENOL	UG/L	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1
PHENANTHRENE	UG/L	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1
PHENOL	UG/L	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1
PYRENE	UG/L	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1	10	10	1	1

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TABLE 3: Data Comparability and Confirmation--VOCs

Gen ID	ANALYTE	Spring 1999 Event	Spring 2000 Event	Fall 2001 Event	Q3 2003 Event	Ratio 1999/2003	Ratio 2000/2003	Ratio 2001/2003	Index Value 1999/2003	Index Value 2000/2003	Index Value 2001/2003
MW01-01	1,1,1-TRICHLOROETHANE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	1,1,2,2-TETRACHLOROETHANE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE			1.0	1.0	NA	NA	1.0	NA	NA	1.0
	1,1,2-TRICHLOROETHANE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	1,1-DICHLOROETHANE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	1,1-DICHLOROETHENE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	1,2-DICHLOROETHANE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	1,2-DICHLOROPROPANE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	2-BUTANONE	10.0	10.0	10.0	10.0	1.0	1.0	1.0	1.0	1.0	1.0
	2-HEXANONE	10.0	10.0	10.0	10.0	1.0	1.0	1.0	1.0	1.0	1.0
	4-METHYL-2-PENTANONE	10.0	10.0	5.0	10.0	1.0	1.0	0.5	1.0	1.0	1.0
	ACETONE	10.0	10.0	10.0	10.0	1.0	1.0	1.0	1.0	1.0	1.0
	BENZENE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	BROMODICHLOROMETHANE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	BROMOFORM	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	BROMOMETHANE	2.0	2.0	2.0	1.0	2.0	2.0	2.0	1.0	1.0	1.0
	CARBON DISULFIDE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	CARBON TETRACHLORIDE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	CHLOROBENZENE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	CHLOROETHANE	2.0	2.0	2.0	1.0	2.0	2.0	2.0	1.0	1.0	1.0
	CHLOROFORM	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	CHLOROMETHANE	2.0	2.0	2.0	1.0	2.0	2.0	2.0	1.0	1.0	1.0
	CIS-1,2-DICHLOROETHENE	0.8	0.5	0.5	0.5	1.6	1.0	1.0	1.0	1.0	1.0
	CIS-1,3-DICHLOROPROPENE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	DIBROMOCHLOROMETHANE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	ETHYLBENZENE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	METHYLENE CHLORIDE	1.0	1.6	1.0	1.0	1.0	1.6	1.0	1.0	1.0	1.0
	STYRENE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	TETRACHLOROETHENE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	TOLUENE	3.7	1.0	1.0	1.0	3.7	1.0	1.0	1.0	1.0	1.0
	TRANS-1,2-DICHLOROETHENE	0.5	0.5	0.5	0.5	1.0	1.0	1.0	1.0	1.0	1.0
	TRANS-1,3-DICHLOROPROPENE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	TRICHLOROETHENE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	VINYL CHLORIDE	2.0	2.0	2.0	1.0	2.0	2.0	2.0	1.0	1.0	1.0
	XYLENES (TOTAL)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
MW01-02	1,1,1-TRICHLOROETHANE	8.3	10.0		5.0	1.7	2.0	NA	1.0	1.0	NA
	1,1,2,2-TETRACHLOROETHANE	8.3	10.0		5.0	1.7	2.0	NA	1.0	1.0	NA
	1,1,2-TRICHLOROETHANE	8.3	10.0		5.0	1.7	2.0	NA	1.0	1.0	NA
	1,1-DICHLOROETHANE	8.3	10.0		5.0	1.7	2.0	NA	1.0	1.0	NA
	1,1-DICHLOROETHENE	8.3	10.0		5.0	1.7	2.0	NA	1.0	1.0	NA
	1,2-DICHLOROETHANE	8.3	10.0		5.0	1.7	2.0	NA	1.0	1.0	NA
	1,2-DICHLOROPROPANE	240.0	280.0		120.0	2.0	2.3	NA	1.0	1.0	NA
	2-BUTANONE	83.0	100.0		50.0	1.7	2.0	NA	1.0	1.0	NA
	2-HEXANONE	83.0	100.0		50.0	1.7	2.0	NA	1.0	1.0	NA
	4-METHYL-2-PENTANONE	83.0	100.0		50.0	1.7	2.0	NA	1.0	1.0	NA
	ACETONE	83.0	100.0		50.0	1.7	2.0	NA	1.0	1.0	NA
	BENZENE	8.3	10.0		5.0	1.7	2.0	NA	1.0	1.0	NA
	BROMODICHLOROMETHANE	8.3	10.0		5.0	1.7	2.0	NA	1.0	1.0	NA
	BROMOFORM	8.3	10.0		5.0	1.7	2.0	NA	1.0	1.0	NA
	BROMOMETHANE	17.0	20.0		5.0	3.4	4.0	NA	1.0	1.0	NA
	CARBON DISULFIDE	8.3	10.0		5.0	1.7	2.0	NA	1.0	1.0	NA
	CARBON TETRACHLORIDE	8.3	10.0		5.0	1.7	2.0	NA	1.0	1.0	NA
	CHLOROBENZENE	8.3	10.0		5.0	1.7	2.0	NA	1.0	1.0	NA
	CHLOROETHANE	17.0	20.0		5.0	3.4	4.0	NA	1.0	1.0	NA
	CHLOROFORM	8.3	10.0		5.0	1.7	2.0	NA	1.0	1.0	NA
	CHLOROMETHANE	17.0	20.0		5.0	3.4	4.0	NA	1.0	1.0	NA
	CIS-1,2-DICHLOROETHENE	4.2	5.0		2.4	1.8	2.1	NA	1.0	1.0	NA
	CIS-1,3-DICHLOROPROPENE	8.3	10.0		5.0	1.7	2.0	NA	1.0	1.0	NA
	DIBROMOCHLOROMETHANE	8.3	10.0		5.0	1.7	2.0	NA	1.0	1.0	NA
	ETHYLBENZENE	8.3	10.0		5.0	1.7	2.0	NA	1.0	1.0	NA
	METHYLENE CHLORIDE	8.3	10.0		5.0	1.7	2.0	NA	1.0	1.0	NA
	STYRENE	8.3	10.0		5.0	1.7	2.0	NA	1.0	1.0	NA
	TETRACHLOROETHENE	8.3	10.0		5.0	1.7	2.0	NA	1.0	1.0	NA
	TOLUENE	8.3	10.0		5.0	1.7	2.0	NA	1.0	1.0	NA
	TRANS-1,2-DICHLOROETHENE	4.2	5.0		2.5	1.7	2.0	NA	1.0	1.0	NA
	TRANS-1,3-DICHLOROPROPENE	8.3	10.0		5.0	1.7	2.0	NA	1.0	1.0	NA
	TRICHLOROETHENE	8.3	10.0		2.5	3.3	4.0	NA	1.0	1.0	NA
	VINYL CHLORIDE	17.0	20.0		5.0	3.4	4.0	NA	1.0	1.0	NA
	XYLENES (TOTAL)	8.3	10.0		5.0	1.7	2.0	NA	1.0	1.0	NA
MW01-02CD	1,1,1-TRICHLOROETHANE	1.0	1.0		1.0	1.0	1.0	NA	1.0	1.0	NA
	1,1,2,2-TETRACHLOROETHANE	1.0	1.0		1.0	1.0	1.0	NA	1.0	1.0	NA
	1,1,2-TRICHLOROETHANE	1.0	1.0		1.0	1.0	1.0	NA	1.0	1.0	NA
	1,1-DICHLOROETHANE	1.0	1.0		1.0	1.0	1.0	NA	1.0	1.0	NA
	1,1-DICHLOROETHENE	1.0	1.0		1.0	1.0	1.0	NA	1.0	1.0	NA
	1,2-DICHLOROETHANE	1.0	1.0		1.0	1.0	1.0	NA	1.0	1.0	NA
	1,2-DICHLOROPROPANE	1.0	1.0		1.0	1.0	1.0	NA	1.0	1.0	NA
	2-BUTANONE	10.0	10.0		10.0	1.0	1.0	NA	1.0	1.0	NA
	2-HEXANONE	10.0	10.0		10.0	1.0	1.0	NA	1.0	1.0	NA
	4-METHYL-2-PENTANONE	10.0	10.0		10.0	1.0	1.0	NA	1.0	1.0	NA
	ACETONE	10.0	10.0		10.0	1.0	1.0	NA	1.0	1.0	NA
	BENZENE	1.0	1.0		1.0	1.0	1.0	NA	1.0	1.0	NA
	BROMODICHLOROMETHANE	1.0	1.0		1.0	1.0	1.0	NA	1.0	1.0	NA
	BROMOFORM	1.0	1.0		1.0	1.0	1.0	NA	1.0	1.0	NA
	BROMOMETHANE	2.0	2.0		1.0	2.0	2.0	NA	1.0	1.0	NA
	CARBON DISULFIDE	1.0	1.0		1.0	1.0	1.0	NA	1.0	1.0	NA
	CARBON TETRACHLORIDE	1.0	1.0		1.0	1.0	1.0	NA	1.0	1.0	NA
	CHLOROBENZENE	1.0	1.0		1.0	1.0	1.0	NA	1.0	1.0	NA
	CHLOROETHANE	2.0	2.0		1.0	2.0	2.0	NA	1.0	1.0	NA
	CHLOROFORM	1.0	1.0		1.0	1.0	1.0	NA	1.0	1.0	NA
	CHLOROMETHANE	2.0	2.0		1.0	2.0	2.0	NA	1.0	1.0	NA
	CIS-1,2-DICHLOROETHENE	0.5	0.5		0.5	1.0	1.0	NA	1.0	1.0	NA
	CIS-1,3-DICHLOROPROPENE	1.0	1.0		1.0	1.0	1.0	NA	1.0	1.0	NA
	DIBROMOCHLOROMETHANE	1.0	1.0		1.0	1.0	1.0	NA	1.0	1.0	NA
	ETHYLBENZENE	1.0	1.0		1.0	1.0	1.0	NA	1.0	1.0	NA

The Payne Firm, Inc.

TABLE 3: Data Comparability and Confirmation--VOCs

Gen ID	ANALYTE	Spring 1999 Event	Spring 2000 Event	Fall 2001 Event	Q3 2003 Event	Ratio 1999/2003	Ratio 2000/2003	Ratio 2001/2003	Index Value 1999/2003	Index Value 2000/2003	Index Value 2001/2003
MW01-02CD	METHYLENE CHLORIDE	1.1	1.5		1.0	1.1	1.5	NA	1.0	1.0	NA
	STYRENE	1.0	1.0		1.0	1.0	1.0	NA	1.0	1.0	NA
	TETRACHLOROETHENE	1.0	1.0		1.0	1.0	1.0	NA	1.0	1.0	NA
	TOLUENE	25.0	1.0		1.0	25.0	1.0	NA	0.0	1.0	NA
	TRANS-1,2-DICHLOROETHENE	0.5	0.5		0.5	1.0	1.0	NA	1.0	1.0	NA
	TRANS-1,3-DICHLOROPROPENE	1.0	1.0		1.0	1.0	1.0	NA	1.0	1.0	NA
	TRICHLOROETHENE	1.0	1.0		1.0	1.0	1.0	NA	1.0	1.0	NA
	VINYL CHLORIDE	2.0	2.0		1.0	2.0	2.0	NA	1.0	1.0	NA
	XYLENES (TOTAL)	1.0	1.0		1.0	1.0	1.0	NA	1.0	1.0	NA
MW01-02SE	1,1,1-TRICHLOROETHANE	1.0	1.0		1.0	1.0	1.0	NA	1.0	1.0	NA
	1,1,2,2-TETRACHLOROETHANE	1.0	1.0		1.0	1.0	1.0	NA	1.0	1.0	NA
	1,1,2-TRICHLOROETHANE	1.0	1.0		1.0	1.0	1.0	NA	1.0	1.0	NA
	1,1-DICHLOROETHANE	1.0	1.0		1.0	1.0	1.0	NA	1.0	1.0	NA
	1,1-DICHLOROETHENE	1.0	1.0		1.0	1.0	1.0	NA	1.0	1.0	NA
	1,2-DICHLOROETHANE	1.0	1.0		1.0	1.0	1.0	NA	1.0	1.0	NA
	1,2-DICHLOROPROPANE	1.0	1.0		1.0	1.0	1.0	NA	1.0	1.0	NA
	2-BUTANONE	10.0	10.0		10.0	1.0	1.0	NA	1.0	1.0	NA
	2-HEXANONE	10.0	10.0		10.0	1.0	1.0	NA	1.0	1.0	NA
	4-METHYL-2-PENTANONE	10.0	10.0		10.0	1.0	1.0	NA	1.0	1.0	NA
	ACETONE	10.0	10.0		10.0	1.0	1.0	NA	1.0	1.0	NA
	BENZENE	1.0	1.0		1.0	1.0	1.0	NA	1.0	1.0	NA
	BROMODICHLOROMETHANE	1.0	1.0		1.0	1.0	1.0	NA	1.0	1.0	NA
	BROMOFORM	1.0	1.0		1.0	1.0	1.0	NA	1.0	1.0	NA
	BROMOMETHANE	2.0	2.0		1.0	2.0	2.0	NA	1.0	1.0	NA
	CARBON DISULFIDE	1.0	1.0		1.0	1.0	1.0	NA	1.0	1.0	NA
	CARBON TETRACHLORIDE	1.0	1.0		1.0	1.0	1.0	NA	1.0	1.0	NA
	CHLOROBENZENE	1.0	1.0		1.0	1.0	1.0	NA	1.0	1.0	NA
	CHLOROETHANE	2.0	2.0		1.0	2.0	2.0	NA	1.0	1.0	NA
	CHLOROFORM	1.0	1.0		1.0	1.0	1.0	NA	1.0	1.0	NA
	CHLOROMETHANE	2.0	2.0		1.0	2.0	2.0	NA	1.0	1.0	NA
	CIS-1,2-DICHLOROETHENE	0.5	0.5		0.5	1.0	1.0	NA	1.0	1.0	NA
	CIS-1,3-DICHLOROPROPENE	1.0	1.0		1.0	1.0	1.0	NA	1.0	1.0	NA
	DIBROMOCHLOROMETHANE	1.0	1.0		1.0	1.0	1.0	NA	1.0	1.0	NA
	ETHYLBENZENE	1.0	1.0		1.0	1.0	1.0	NA	1.0	1.0	NA
	METHYLENE CHLORIDE	1.0	1.7		1.0	1.0	1.7	NA	1.0	1.0	NA
	STYRENE	1.0	1.0		1.0	1.0	1.0	NA	1.0	1.0	NA
	TETRACHLOROETHENE	1.0	1.0		1.0	1.0	1.0	NA	1.0	1.0	NA
	TOLUENE	10.0	1.0		1.0	10.0	1.0	NA	1.0	1.0	NA
	TRANS-1,2-DICHLOROETHENE	0.5	0.5		0.5	1.0	1.0	NA	1.0	1.0	NA
	TRANS-1,3-DICHLOROPROPENE	1.0	1.0		1.0	1.0	1.0	NA	1.0	1.0	NA
	TRICHLOROETHENE	1.0	1.0		1.0	1.0	1.0	NA	1.0	1.0	NA
	VINYL CHLORIDE	2.0	2.0		1.0	2.0	2.0	NA	1.0	1.0	NA
	XYLENES (TOTAL)	1.0	1.0		1.0	1.0	1.0	NA	1.0	1.0	NA
MW01-03	1,1,1-TRICHLOROETHANE	1.0	1.0		1.0	1.0	1.0	NA	1.0	1.0	NA
	1,1,2,2-TETRACHLOROETHANE	1.0	1.0		1.0	1.0	1.0	NA	1.0	1.0	NA
	1,1,2-TRICHLOROETHANE	1.0	1.0		1.0	1.0	1.0	NA	1.0	1.0	NA
	1,1-DICHLOROETHANE	1.0	1.0		1.0	1.0	1.0	NA	1.0	1.0	NA
	1,1-DICHLOROETHENE	1.0	1.0		1.0	1.0	1.0	NA	1.0	1.0	NA
	1,2-DICHLOROETHANE	1.0	1.0		1.0	1.0	1.0	NA	1.0	1.0	NA
	1,2-DICHLOROPROPANE	1.0	1.0		1.0	1.0	1.0	NA	1.0	1.0	NA
	2-BUTANONE	10.0	10.0		10.0	1.0	1.0	NA	1.0	1.0	NA
	2-HEXANONE	10.0	10.0		10.0	1.0	1.0	NA	1.0	1.0	NA
	4-METHYL-2-PENTANONE	10.0	10.0		10.0	1.0	1.0	NA	1.0	1.0	NA
	ACETONE	10.0	10.0		10.0	1.0	1.0	NA	1.0	1.0	NA
	BENZENE	1.0	1.0		1.0	1.0	1.0	NA	1.0	1.0	NA
	BROMODICHLOROMETHANE	1.0	1.0		1.0	1.0	1.0	NA	1.0	1.0	NA
	BROMOFORM	1.0	1.0		1.0	1.0	1.0	NA	1.0	1.0	NA
	BROMOMETHANE	2.0	2.0		1.0	2.0	2.0	NA	1.0	1.0	NA
	CARBON DISULFIDE	1.0	1.0		1.0	1.0	1.0	NA	1.0	1.0	NA
	CARBON TETRACHLORIDE	1.0	1.0		1.0	1.0	1.0	NA	1.0	1.0	NA
	CHLOROBENZENE	1.0	1.0		1.0	1.0	1.0	NA	1.0	1.0	NA
	CHLOROETHANE	2.0	2.0		1.0	2.0	2.0	NA	1.0	1.0	NA
	CHLOROFORM	1.0	1.0		1.0	1.0	1.0	NA	1.0	1.0	NA
	CHLOROMETHANE	2.0	2.0		1.0	2.0	2.0	NA	1.0	1.0	NA
	CIS-1,2-DICHLOROETHENE	1.0	0.8		0.5	2.0	1.6	NA	1.0	1.0	NA
	CIS-1,3-DICHLOROPROPENE	1.0	1.0		1.0	1.0	1.0	NA	1.0	1.0	NA
	DIBROMOCHLOROMETHANE	1.0	1.0		1.0	1.0	1.0	NA	1.0	1.0	NA
	ETHYLBENZENE	1.0	1.0		1.0	1.0	1.0	NA	1.0	1.0	NA
	METHYLENE CHLORIDE	1.0	1.0		1.0	1.0	1.0	NA	1.0	1.0	NA
	STYRENE	1.0	1.0		1.0	1.0	1.0	NA	1.0	1.0	NA
	TETRACHLOROETHENE	1.0	1.0		0.6	1.7	1.7	NA	1.0	1.0	NA
	TOLUENE	1.0	1.0		2.6	0.4	0.4	NA	1.0	1.0	NA
	TRANS-1,2-DICHLOROETHENE	0.5	0.5		0.5	1.0	1.0	NA	1.0	1.0	NA
	TRANS-1,3-DICHLOROPROPENE	1.0	1.0		1.0	1.0	1.0	NA	1.0	1.0	NA
	TRICHLOROETHENE	3.1	2.4		0.5	6.9	5.3	NA	1.0	1.0	NA
	VINYL CHLORIDE	2.0	2.0		1.0	2.0	2.0	NA	1.0	1.0	NA
	XYLENES (TOTAL)	1.0	1.0		1.0	1.0	1.0	NA	1.0	1.0	NA
MW01-03CD	1,1,1-TRICHLOROETHANE	1.0	1.0		1.0	1.0	1.0	NA	1.0	1.0	NA
	1,1,2,2-TETRACHLOROETHANE	1.0	1.0		1.0	1.0	1.0	NA	1.0	1.0	NA
	1,1,2-TRICHLOROETHANE	1.0	1.0		1.0	1.0	1.0	NA	1.0	1.0	NA
	1,1-DICHLOROETHANE	1.0	1.0		1.0	1.0	1.0	NA	1.0	1.0	NA
	1,1-DICHLOROETHENE	1.0	1.0		1.0	1.0	1.0	NA	1.0	1.0	NA
	1,2-DICHLOROETHANE	1.0	1.0		1.0	1.0	1.0	NA	1.0	1.0	NA
	1,2-DICHLOROPROPANE	1.0	1.0		1.0	1.0	1.0	NA	1.0	1.0	NA
	2-BUTANONE	10.0	10.0		10.0	1.0	1.0	NA	1.0	1.0	NA
	2-HEXANONE	10.0	10.0		10.0	1.0	1.0	NA	1.0	1.0	NA
	4-METHYL-2-PENTANONE	10.0	10.0		10.0	1.0	1.0	NA	1.0	1.0	NA
	ACETONE	10.0	10.0		10.0	1.0	1.0	NA	1.0	1.0	NA
	BENZENE	1.0	1.0		1.0	1.0	1.0	NA	1.0	1.0	NA
	BROMODICHLOROMETHANE	1.0	1.0		1.0	1.0	1.0	NA	1.0	1.0	NA
	BROMOFORM	1.0	1.0		1.0	1.0	1.0	NA	1.0	1.0	NA
	BROMOMETHANE	2.0	2.0		1.0	2.0	2.0	NA	1.0	1.0	NA
	CARBON DISULFIDE	1.0	1.0		1.0	1.0	1.0	NA	1.0	1.0	NA
	CARBON TETRACHLORIDE	1.0	1.0		1.0	1.0	1.0	NA	1.0	1.0	NA
	CHLOROBENZENE	1.0	1.0		1.0	1.0	1.0	NA	1.0	1.0	NA
	CHLOROETHANE	2.0	2.0		1.0	2.0	2.0	NA	1.0	1.0	NA
	CHLOROFORM	1.0	1.0		1.0	1.0	1.0	NA	1.0	1.0	NA
	CHLOROMETHANE	2.0	2.0		1.0	2.0	2.0	NA	1.0	1.0	NA
	CIS-1,2-DICHLOROETHENE	0.5	0.5		0.5	1.0	1.0	NA	1.0	1.0	NA

The Payne Firm, Inc.

TABLE 3: Data Comparability and Confirmation--VOCs

Gen ID	ANALYTE	Spring 1999 Event	Spring 2000 Event	Fall 2001 Event	Q3 2003 Event	Ratio 1999/2003	Ratio 2000/2003	Ratio 2001/2003	Index Value 1999/2003	Index Value 2000/2003	Index Value 2001/2003
MW01-03CD	CIS-1,3-DICHLOROPROPENE	1.0	1.0		1.0	1.0	1.0	NA	1.0	1.0	NA
	DIBROMOCHLOROMETHANE	1.0	1.0		1.0	1.0	1.0	NA	1.0	1.0	NA
	ETHYLBENZENE	1.0	1.0		1.0	1.0	1.0	NA	1.0	1.0	NA
	METHYLENE CHLORIDE	1.0	1.0		1.0	1.0	1.0	NA	1.0	1.0	NA
	STYRENE	1.0	1.0		1.0	1.0	1.0	NA	1.0	1.0	NA
	TETRACHLOROETHENE	1.0	1.0		1.0	1.0	1.0	NA	1.0	1.0	NA
	TOLUENE	6.2	1.0		1.0	6.2	1.0	NA	1.0	1.0	NA
	TRANS-1,2-DICHLOROETHENE	0.5	0.5		0.5	1.0	1.0	NA	1.0	1.0	NA
	TRANS-1,3-DICHLOROPROPENE	1.0	1.0		1.0	1.0	1.0	NA	1.0	1.0	NA
	TRICHLOROETHENE	1.0	1.0		1.0	1.0	1.0	NA	1.0	1.0	NA
	VINYL CHLORIDE	2.0	2.0		1.0	2.0	2.0	NA	1.0	1.0	NA
	XYLENES (TOTAL)	1.0	1.0		1.0	1.0	1.0	NA	1.0	1.0	NA
MW01-06	1,1,1-TRICHLOROETHANE	25.0	33.0		40.0	0.6	0.8	NA	1.0	1.0	NA
	1,1,2,2-TETRACHLOROETHANE	25.0	33.0		40.0	0.6	0.8	NA	1.0	1.0	NA
	1,1,2-TRICHLOROETHANE	25.0	33.0		40.0	0.6	0.8	NA	1.0	1.0	NA
	1,1-DICHLOROETHANE	25.0	33.0		40.0	0.6	0.8	NA	1.0	1.0	NA
	1,1-DICHLOROETHENE	25.0	33.0		40.0	0.6	0.8	NA	1.0	1.0	NA
	1,2-DICHLOROETHANE	25.0	33.0		40.0	0.6	0.8	NA	1.0	1.0	NA
	1,2-DICHLOROPROPANE	25.0	33.0		40.0	0.6	0.8	NA	1.0	1.0	NA
	2-BUTANONE	250.0	330.0		400.0	0.6	0.8	NA	1.0	1.0	NA
	2-HEXANONE	250.0	330.0		400.0	0.6	0.8	NA	1.0	1.0	NA
	4-METHYL-2-PENTANONE	250.0	330.0		400.0	0.6	0.8	NA	1.0	1.0	NA
	ACETONE	250.0	330.0		400.0	0.6	0.8	NA	1.0	1.0	NA
	BENZENE	25.0	33.0		40.0	0.6	0.8	NA	1.0	1.0	NA
	BROMODICHLOROMETHANE	25.0	33.0		40.0	0.6	0.8	NA	1.0	1.0	NA
	BROMOFORM	25.0	33.0		40.0	0.6	0.8	NA	1.0	1.0	NA
	BROMOMETHANE	50.0	67.0		12.0	4.2	5.6	NA	1.0	1.0	NA
	CARBON DISULFIDE	25.0	33.0		40.0	0.6	0.8	NA	1.0	1.0	NA
	CARBON TETRACHLORIDE	25.0	33.0		40.0	0.6	0.8	NA	1.0	1.0	NA
	CHLOROBENZENE	25.0	33.0		40.0	0.6	0.8	NA	1.0	1.0	NA
	CHLOROETHANE	50.0	67.0		40.0	1.3	1.7	NA	1.0	1.0	NA
	CHLOROFORM	25.0	33.0		40.0	0.6	0.8	NA	1.0	1.0	NA
	CHLOROMETHANE	50.0	67.0		40.0	1.3	1.7	NA	1.0	1.0	NA
	CIS-1,2-DICHLOROETHENE	40.0	24.0		25.0	1.6	1.0	NA	1.0	1.0	NA
	CIS-1,3-DICHLOROPROPENE	25.0	33.0		40.0	0.6	0.8	NA	1.0	1.0	NA
	DIBROMOCHLOROMETHANE	25.0	33.0		40.0	0.6	0.8	NA	1.0	1.0	NA
	ETHYLBENZENE	25.0	33.0		40.0	0.6	0.8	NA	1.0	1.0	NA
	METHYLENE CHLORIDE	25.0	33.0		40.0	0.6	0.8	NA	1.0	1.0	NA
	STYRENE	25.0	33.0		40.0	0.6	0.8	NA	1.0	1.0	NA
	TETRACHLOROETHENE	25.0	33.0		18.0	1.4	1.8	NA	1.0	1.0	NA
	TOLUENE	25.0	33.0		40.0	0.6	0.8	NA	1.0	1.0	NA
	TRANS-1,2-DICHLOROETHENE	12.0	17.0		20.0	0.6	0.9	NA	1.0	1.0	NA
	TRANS-1,3-DICHLOROPROPENE	25.0	33.0		40.0	0.6	0.8	NA	1.0	1.0	NA
	TRICHLOROETHENE	630.0	1100.0		1400.0	0.5	0.8	NA	1.0	1.0	NA
	VINYL CHLORIDE	50.0	67.0		40.0	1.3	1.7	NA	1.0	1.0	NA
	XYLENES (TOTAL)	25.0	33.0		40.0	0.6	0.8	NA	1.0	1.0	NA
MW01-07	1,1,1-TRICHLOROETHANE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	1,1,2,2-TETRACHLOROETHANE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	1,1,2-TRICHLOROETHANE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	1,1-DICHLOROETHANE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	1,1-DICHLOROETHENE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	1,2-DICHLOROETHANE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	1,2-DICHLOROPROPANE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	2-BUTANONE	10.0	10.0	10.0	10.0	1.0	1.0	1.0	1.0	1.0	1.0
	2-HEXANONE	10.0	10.0	10.0	10.0	1.0	1.0	1.0	1.0	1.0	1.0
	4-METHYL-2-PENTANONE	10.0	10.0	5.0	10.0	1.0	1.0	0.5	1.0	1.0	1.0
	ACETONE	10.0	10.0	10.0	10.0	1.0	1.0	1.0	1.0	1.0	1.0
	BENZENE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	BROMODICHLOROMETHANE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	BROMOFORM	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	BROMOMETHANE	2.0	2.0	2.0	1.0	2.0	2.0	2.0	1.0	1.0	1.0
	CARBON DISULFIDE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	CARBON TETRACHLORIDE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	CHLOROBENZENE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	CHLOROETHANE	2.0	2.0	2.0	1.0	2.0	2.0	2.0	1.0	1.0	1.0
	CHLOROFORM	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	CHLOROMETHANE	2.0	2.0	2.0	1.0	2.0	2.0	2.0	1.0	1.0	1.0
	CIS-1,2-DICHLOROETHENE	0.5	0.5	0.5	0.5	1.0	1.0	1.0	1.0	1.0	1.0
	CIS-1,3-DICHLOROPROPENE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	DIBROMOCHLOROMETHANE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	ETHYLBENZENE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	METHYLENE CHLORIDE	1.0	1.5	1.0	1.0	1.0	1.5	1.0	1.0	1.0	1.0
	STYRENE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	TETRACHLOROETHENE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	TOLUENE	1.0	1.0	1.0	1.1	0.9	0.9	0.9	1.0	1.0	1.0
	TRANS-1,2-DICHLOROETHENE	0.5	0.5	0.5	0.5	1.0	1.0	1.0	1.0	1.0	1.0
	TRANS-1,3-DICHLOROPROPENE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	TRICHLOROETHENE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	VINYL CHLORIDE	2.0	2.0	2.0	1.0	2.0	2.0	2.0	1.0	1.0	1.0
	XYLENES (TOTAL)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
MW01-11	1,1,1-TRICHLOROETHANE		1.0		1.0	NA	1.0	NA	NA	1.0	NA
	1,1,2,2-TETRACHLOROETHANE		1.0		1.0	NA	1.0	NA	NA	1.0	NA
	1,1,2-TRICHLOROETHANE		1.0		1.0	NA	1.0	NA	NA	1.0	NA
	1,1-DICHLOROETHANE		1.0		1.0	NA	1.0	NA	NA	1.0	NA
	1,1-DICHLOROETHENE		1.0		1.0	NA	1.0	NA	NA	1.0	NA
	1,2-DICHLOROETHANE		1.0		1.0	NA	1.0	NA	NA	1.0	NA
	1,2-DICHLOROPROPANE		1.0		1.0	NA	1.0	NA	NA	1.0	NA
	2-BUTANONE		10.0		10.0	NA	1.0	NA	NA	1.0	NA
	2-HEXANONE		10.0		10.0	NA	1.0	NA	NA	1.0	NA
	4-METHYL-2-PENTANONE		10.0		10.0	NA	1.0	NA	NA	1.0	NA
	ACETONE		10.0		10.0	NA	1.0	NA	NA	1.0	NA
	BENZENE		1.0		1.0	NA	1.0	NA	NA	1.0	NA
	BROMODICHLOROMETHANE		1.0		1.0	NA	1.0	NA	NA	1.0	NA
	BROMOFORM		1.0		1.0	NA	1.0	NA	NA	1.0	NA
	BROMOMETHANE		2.0		1.0	NA	2.0	NA	NA	1.0	NA
	CARBON DISULFIDE		1.0		1.0	NA	1.0	NA	NA	1.0	NA
	CARBON TETRACHLORIDE		1.0		1.0	NA	1.0	NA	NA	1.0	NA
	CHLOROBENZENE		1.0		1.0	NA	1.0	NA	NA	1.0	NA
	CHLOROETHANE		2.0		1.0	NA	2.0	NA	NA	1.0	NA

The Payne Firm, Inc.

TABLE 3: Data Comparability and Confirmation--VOCs

Gen ID	ANALYTE	Spring 1999 Event	Spring 2000 Event	Fall 2001 Event	Q3 2003 Event	Ratio 1999/2003	Ratio 2000/2003	Ratio 2001/2003	Index Value 1999/2003	Index Value 2000/2003	Index Value 2001/2003
MW01-11	CHLOROFORM		1.0		1.0	NA	1.0	NA	NA	1.0	NA
	CHLOROMETHANE		2.0		1.0	NA	2.0	NA	NA	1.0	NA
	CIS-1,2-DICHLOROETHENE		8.9		10.0	NA	0.9	NA	NA	1.0	NA
	CIS-1,3-DICHLOROPROPENE		1.0		1.0	NA	1.0	NA	NA	1.0	NA
	DIBROMOCHLOROMETHANE		1.0		1.0	NA	1.0	NA	NA	1.0	NA
	ETHYLBENZENE		1.0		1.0	NA	1.0	NA	NA	1.0	NA
	METHYLENE CHLORIDE		1.0		1.0	NA	1.0	NA	NA	1.0	NA
	STYRENE		1.0		1.0	NA	1.0	NA	NA	1.0	NA
	TETRACHLOROETHENE		1.0		1.0	NA	1.0	NA	NA	1.0	NA
	TOLUENE		1.0		1.0	NA	1.0	NA	NA	1.0	NA
	TRANS-1,2-DICHLOROETHENE		0.5		0.5	NA	1.1	NA	NA	1.0	NA
	TRANS-1,3-DICHLOROPROPENE		1.0		1.0	NA	1.0	NA	NA	1.0	NA
	TRICHLOROETHENE		26.0		32.0	NA	0.8	NA	NA	1.0	NA
	VINYL CHLORIDE		2.0		1.0	NA	2.0	NA	NA	1.0	NA
	XYLENES (TOTAL)		1.0		1.0	NA	1.0	NA	NA	1.0	NA
MW01-12	1,1,1-TRICHLOROETHANE		1.0		1.0	NA	1.0	NA	NA	1.0	NA
	1,1,2,2-TETRACHLOROETHANE		1.0		1.0	NA	1.0	NA	NA	1.0	NA
	1,1,2-TRICHLOROETHANE		1.0		1.0	NA	1.0	NA	NA	1.0	NA
	1,1-DICHLOROETHANE		1.0		1.0	NA	1.0	NA	NA	1.0	NA
	1,1-DICHLOROETHENE		1.0		1.0	NA	1.0	NA	NA	1.0	NA
	1,2-DICHLOROETHANE		1.0		1.0	NA	1.0	NA	NA	1.0	NA
	1,2-DICHLOROPROPANE		1.0		1.0	NA	1.0	NA	NA	1.0	NA
	2-BUTANONE		10.0		10.0	NA	1.0	NA	NA	1.0	NA
	2-HEXANONE		10.0		10.0	NA	1.0	NA	NA	1.0	NA
	4-METHYL-2-PENTANONE		10.0		10.0	NA	1.0	NA	NA	1.0	NA
	ACETONE		10.0		10.0	NA	1.0	NA	NA	1.0	NA
	BENZENE		1.0		1.0	NA	1.0	NA	NA	1.0	NA
	BROMODICHLOROMETHANE		1.0		1.0	NA	1.0	NA	NA	1.0	NA
	BROMOFORM		1.0		1.0	NA	1.0	NA	NA	1.0	NA
	BROMOMETHANE		2.0		1.0	NA	2.0	NA	NA	1.0	NA
	CARBON DISULFIDE		1.0		1.0	NA	1.0	NA	NA	1.0	NA
	CARBON TETRACHLORIDE		1.0		1.0	NA	1.0	NA	NA	1.0	NA
	CHLOROBENZENE		1.0		1.0	NA	1.0	NA	NA	1.0	NA
	CHLOROETHANE		2.0		1.0	NA	2.0	NA	NA	1.0	NA
	CHLOROFORM		1.0		1.0	NA	1.0	NA	NA	1.0	NA
	CHLOROMETHANE		2.0		1.0	NA	2.0	NA	NA	1.0	NA
	CIS-1,2-DICHLOROETHENE		0.5		0.5	NA	1.0	NA	NA	1.0	NA
	CIS-1,3-DICHLOROPROPENE		1.0		1.0	NA	1.0	NA	NA	1.0	NA
	DIBROMOCHLOROMETHANE		1.0		1.0	NA	1.0	NA	NA	1.0	NA
	ETHYLBENZENE		1.0		1.0	NA	1.0	NA	NA	1.0	NA
	METHYLENE CHLORIDE		1.4		1.0	NA	1.4	NA	NA	1.0	NA
	STYRENE		1.0		1.0	NA	1.0	NA	NA	1.0	NA
	TETRACHLOROETHENE		1.0		0.5	NA	2.0	NA	NA	1.0	NA
	TOLUENE		1.0		1.2	NA	0.8	NA	NA	1.0	NA
	TRANS-1,2-DICHLOROETHENE		0.5		0.5	NA	1.0	NA	NA	1.0	NA
	TRANS-1,3-DICHLOROPROPENE		1.0		1.0	NA	1.0	NA	NA	1.0	NA
	TRICHLOROETHENE		4.6		3.2	NA	1.4	NA	NA	1.0	NA
	VINYL CHLORIDE		2.0		1.0	NA	2.0	NA	NA	1.0	NA
	XYLENES (TOTAL)		1.0		1.0	NA	1.0	NA	NA	1.0	NA
MW02-01	1,1,1-TRICHLOROETHANE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	1,1,2,2-TETRACHLOROETHANE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	1,1,2-TRICHLOROETHANE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	1,1-DICHLOROETHANE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	1,1-DICHLOROETHENE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	1,2-DICHLOROETHANE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	1,2-DICHLOROPROPANE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	2-BUTANONE	10.0	10.0	10.0	10.0	1.0	1.0	1.0	1.0	1.0	1.0
	2-HEXANONE	10.0	10.0	10.0	10.0	1.0	1.0	1.0	1.0	1.0	1.0
	4-METHYL-2-PENTANONE	10.0	10.0	5.0	10.0	1.0	1.0	0.5	1.0	1.0	1.0
	ACETONE	10.0	10.0	10.0	10.0	1.0	1.0	1.0	1.0	1.0	1.0
	BENZENE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	BROMODICHLOROMETHANE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	BROMOFORM	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	BROMOMETHANE	2.0	2.0	2.0	1.0	2.0	2.0	2.0	1.0	1.0	1.0
	CARBON DISULFIDE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	CARBON TETRACHLORIDE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	CHLOROBENZENE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	CHLOROETHANE	2.0	2.0	2.0	1.0	2.0	2.0	2.0	1.0	1.0	1.0
	CHLOROFORM	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	CHLOROMETHANE	2.0	2.0	2.0	1.0	2.0	2.0	2.0	1.0	1.0	1.0
	CIS-1,2-DICHLOROETHENE	0.5	0.5	0.5	0.5	1.0	1.0	1.0	1.0	1.0	1.0
	CIS-1,3-DICHLOROPROPENE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	DIBROMOCHLOROMETHANE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	ETHYLBENZENE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	METHYLENE CHLORIDE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	STYRENE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	TETRACHLOROETHENE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	TOLUENE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	TRANS-1,2-DICHLOROETHENE	0.5	0.5	0.5	0.5	1.0	1.0	1.0	1.0	1.0	1.0
	TRANS-1,3-DICHLOROPROPENE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	TRICHLOROETHENE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	VINYL CHLORIDE	2.0	2.0	2.0	1.0	2.0	2.0	2.0	1.0	1.0	1.0
	XYLENES (TOTAL)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
MW02-02	1,1,1-TRICHLOROETHANE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	1,1,2,2-TETRACHLOROETHANE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	1,1,2-TRICHLOROETHANE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	1,1-DICHLOROETHANE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	1,1-DICHLOROETHENE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	1,2-DICHLOROETHANE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	1,2-DICHLOROPROPANE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	2-BUTANONE	10.0	10.0	10.0	10.0	1.0	1.0	1.0	1.0	1.0	1.0
	2-HEXANONE	10.0	10.0	10.0	10.0	1.0	1.0	1.0	1.0	1.0	1.0
	4-METHYL-2-PENTANONE	10.0	10.0	5.0	10.0	1.0	1.0	0.5	1.0	1.0	1.0
	ACETONE	10.0	10.0	10.0	10.0	1.0	1.0	1.0	1.0	1.0	1.0
	BENZENE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	BROMODICHLOROMETHANE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	BROMOFORM	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	BROMOMETHANE	2.0	2.0	2.0	1.0	2.0	2.0	2.0	1.0	1.0	1.0
	CARBON DISULFIDE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

The Payne Firm, Inc.

TABLE 3: Data Comparability and Confirmation--VOCs

Gen ID	ANALYTE	Spring 1999 Event	Spring 2000 Event	Fall 2001 Event	Q3 2003 Event	Ratio 1999/2003	Ratio 2000/2003	Ratio 2001/2003	Index Value 1999/2003	Index Value 2000/2003	Index Value 2001/2003
MW02-02	CARBON TETRACHLORIDE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	CHLOROBENZENE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	CHLOROETHANE	2.0	2.0	2.0	1.0	2.0	2.0	2.0	1.0	1.0	1.0
	CHLOROFORM	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	CHLOROMETHANE	2.0	2.0	2.0	1.0	2.0	2.0	2.0	1.0	1.0	1.0
	CIS-1,2-DICHLOROETHENE	8.2	2.7	0.5	1.0	8.2	2.7	0.5	1.0	1.0	1.0
	CIS-1,3-DICHLOROPROPENE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	DIBROMOCHLOROMETHANE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	ETHYLBENZENE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	METHYLENE CHLORIDE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	STYRENE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	TETRACHLOROETHENE	2.8	3.4	1.0	1.1	2.5	3.1	0.9	1.0	1.0	1.0
	TOLUENE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	TRANS-1,2-DICHLOROETHENE	0.5	0.5	0.5	0.5	1.0	1.0	1.0	1.0	1.0	1.0
	TRANS-1,3-DICHLOROPROPENE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	TRICHLOROETHENE	5.7	4.0	1.0	1.3	4.4	3.1	0.8	1.0	1.0	1.0
	VINYL CHLORIDE	2.0	2.0	2.0	1.0	2.0	2.0	2.0	1.0	1.0	1.0
	XYLENES (TOTAL)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
MW02-03	1,1,1-TRICHLOROETHANE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	1,1,2,2-TETRACHLOROETHANE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	1,1,2-TRICHLOROETHANE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	1,1-DICHLOROETHANE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	1,1-DICHLOROETHENE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	1,2-DICHLOROETHANE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	1,2-DICHLOROPROPANE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	2-BUTANONE	10.0	10.0	10.0	10.0	1.0	1.0	1.0	1.0	1.0	1.0
	2-HEXANONE	10.0	10.0	10.0	10.0	1.0	1.0	1.0	1.0	1.0	1.0
	4-METHYL-2-PENTANONE	10.0	10.0	5.0	10.0	1.0	1.0	0.5	1.0	1.0	1.0
	ACETONE	10.0	10.0	10.0	10.0	1.0	1.0	1.0	1.0	1.0	1.0
	BENZENE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	BROMODICHLOROMETHANE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	BROMOFORM	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	BROMOMETHANE	2.0	2.0	2.0	1.0	2.0	2.0	2.0	1.0	1.0	1.0
	CARBON DISULFIDE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	CARBON TETRACHLORIDE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	CHLOROBENZENE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	CHLOROETHANE	2.0	2.0	2.0	1.0	2.0	2.0	2.0	1.0	1.0	1.0
	CHLOROFORM	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	CHLOROMETHANE	2.0	2.0	2.0	1.0	2.0	2.0	2.0	1.0	1.0	1.0
	CIS-1,2-DICHLOROETHENE	1.4	3.2	0.5	0.6	2.3	5.2	0.8	1.0	1.0	1.0
	CIS-1,3-DICHLOROPROPENE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	DIBROMOCHLOROMETHANE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	ETHYLBENZENE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	METHYLENE CHLORIDE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	STYRENE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	TETRACHLOROETHENE	4.5	19.0	5.3	11.0	0.4	1.7	0.5	1.0	1.0	1.0
	TOLUENE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	TRANS-1,2-DICHLOROETHENE	0.5	0.5	0.5	0.5	1.0	1.0	1.0	1.0	1.0	1.0
	TRANS-1,3-DICHLOROPROPENE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	TRICHLOROETHENE	1.6	4.5	1.1	2.3	0.7	2.0	0.5	1.0	1.0	1.0
	VINYL CHLORIDE	2.0	2.0	2.0	1.0	2.0	2.0	2.0	1.0	1.0	1.0
	XYLENES (TOTAL)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
MW02-04	1,1,1-TRICHLOROETHANE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	1,1,2,2-TETRACHLOROETHANE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	1,1,2-TRICHLOROETHANE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	1,1-DICHLOROETHANE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	1,1-DICHLOROETHENE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	1,2-DICHLOROETHANE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	1,2-DICHLOROPROPANE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	2-BUTANONE	10.0	10.0	10.0	10.0	1.0	1.0	1.0	1.0	1.0	1.0
	2-HEXANONE	10.0	10.0	10.0	10.0	1.0	1.0	1.0	1.0	1.0	1.0
	4-METHYL-2-PENTANONE	10.0	10.0	5.0	10.0	1.0	1.0	0.5	1.0	1.0	1.0
	ACETONE	10.0	10.0	10.0	10.0	1.0	1.0	1.0	1.0	1.0	1.0
	BENZENE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	BROMODICHLOROMETHANE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	BROMOFORM	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	BROMOMETHANE	2.0	2.0	2.0	1.0	2.0	2.0	2.0	1.0	1.0	1.0
	CARBON DISULFIDE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	CARBON TETRACHLORIDE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	CHLOROBENZENE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	CHLOROETHANE	2.0	2.0	2.0	1.0	2.0	2.0	2.0	1.0	1.0	1.0
	CHLOROFORM	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	CHLOROMETHANE	2.0	2.0	2.0	1.0	2.0	2.0	2.0	1.0	1.0	1.0
	CIS-1,2-DICHLOROETHENE	0.5	0.5	0.5	0.5	1.0	1.0	1.0	1.0	1.0	1.0
	CIS-1,3-DICHLOROPROPENE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	DIBROMOCHLOROMETHANE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	ETHYLBENZENE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	METHYLENE CHLORIDE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	STYRENE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	TETRACHLOROETHENE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	TOLUENE	1.0	1.0	1.0	0.4	2.3	2.3	2.3	1.0	1.0	1.0
	TRANS-1,2-DICHLOROETHENE	0.5	0.5	0.5	0.5	1.0	1.0	1.0	1.0	1.0	1.0
	TRANS-1,3-DICHLOROPROPENE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	TRICHLOROETHENE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	VINYL CHLORIDE	2.0	2.0	2.0	1.0	2.0	2.0	2.0	1.0	1.0	1.0
	XYLENES (TOTAL)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
MW02-05	1,1,1-TRICHLOROETHANE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	1,1,2,2-TETRACHLOROETHANE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE			1.0	1.2	NA	NA	0.8	NA	NA	1.0
	1,1,2-TRICHLOROETHANE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	1,1-DICHLOROETHANE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	1,1-DICHLOROETHENE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	1,2-DICHLOROETHANE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	1,2-DICHLOROPROPANE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	2-BUTANONE	10.0	10.0	10.0	10.0	1.0	1.0	1.0	1.0	1.0	1.0
	2-HEXANONE	10.0	10.0	10.0	10.0	1.0	1.0	1.0	1.0	1.0	1.0
	4-METHYL-2-PENTANONE	10.0	10.0	5.0	10.0	1.0	1.0	0.5	1.0	1.0	1.0
	ACETONE	10.0	10.0	10.0	10.0	1.0	1.0	1.0	1.0	1.0	1.0
	BENZENE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

The Payne Firm, Inc.

TABLE 3: Data Comparability and Confirmation--VOCs

Gen ID	ANALYTE	Spring 1999 Event	Spring 2000 Event	Fall 2001 Event	Q3 2003 Event	Ratio 1999/2003	Ratio 2000/2003	Ratio 2001/2003	Index Value 1999/2003	Index Value 2000/2003	Index Value 2001/2003
MW02-05	BROMODICHLOROMETHANE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	BROMOFORM	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	BROMOMETHANE	2.0	2.0	2.0	1.0	2.0	2.0	2.0	1.0	1.0	1.0
	CARBON DISULFIDE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	CARBON TETRACHLORIDE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	CHLOROBENZENE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	CHLOROETHANE	2.0	2.0	2.0	1.0	2.0	2.0	2.0	1.0	1.0	1.0
	CHLOROFORM	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	CHLOROMETHANE	2.0	2.0	2.0	1.0	2.0	2.0	2.0	1.0	1.0	1.0
	CIS-1,2-DICHLOROETHENE	0.5	0.5	0.5	0.5	1.0	1.0	1.0	1.0	1.0	1.0
	CIS-1,3-DICHLOROPROPENE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	DIBROMOCHLOROMETHANE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	ETHYLBENZENE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	METHYLENE CHLORIDE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	STYRENE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	TETRACHLOROETHENE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	TOLUENE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	TRANS-1,2-DICHLOROETHENE	0.5	0.5	0.5	0.5	1.0	1.0	1.0	1.0	1.0	1.0
	TRANS-1,3-DICHLOROPROPENE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	TRICHLOROETHENE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	VINYL CHLORIDE	2.0	2.0	2.0	1.0	2.0	2.0	2.0	1.0	1.0	1.0
	XYLENES (TOTAL)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
MW02-06	1,1,1-TRICHLOROETHANE	1.0	1.0	2.5	2.0	0.5	0.5	1.3	1.0	1.0	1.0
	1,1,2,2-TETRACHLOROETHANE	1.0	1.0	2.5	2.0	0.5	0.5	1.3	1.0	1.0	1.0
	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE			67.0	44.0	NA	NA	1.5	NA	NA	1.0
	1,1,2-TRICHLOROETHANE	1.0	1.0	2.5	2.0	0.5	0.5	1.3	1.0	1.0	1.0
	1,1-DICHLOROETHANE	1.0	1.4	2.5	1.0	1.0	1.4	2.5	1.0	1.0	1.0
	1,1-DICHLOROETHENE	1.0	1.0	2.5	2.0	0.5	0.5	1.3	1.0	1.0	1.0
	1,2-DICHLOROETHANE	1.0	1.0	2.5	2.0	0.5	0.5	1.3	1.0	1.0	1.0
	1,2-DICHLOROPROPANE	1.0	1.0	2.5	2.0	0.5	0.5	1.3	1.0	1.0	1.0
	2-BUTANONE	10.0	10.0	25.0	20.0	0.5	0.5	1.3	1.0	1.0	1.0
	2-HEXANONE	10.0	10.0	25.0	20.0	0.5	0.5	1.3	1.0	1.0	1.0
	4-METHYL-2-PENTANONE	10.0	10.0	12.0	20.0	0.5	0.5	0.6	1.0	1.0	1.0
	ACETONE	10.0	10.0	25.0	20.0	0.5	0.5	1.3	1.0	1.0	1.0
	BENZENE	1.0	1.0	2.5	2.0	0.5	0.5	1.3	1.0	1.0	1.0
	BROMODICHLOROMETHANE	1.0	1.0	2.5	2.0	0.5	0.5	1.3	1.0	1.0	1.0
	BROMOFORM	1.0	1.0	2.5	2.0	0.5	0.5	1.3	1.0	1.0	1.0
	BROMOMETHANE	2.0	2.0	5.0	2.0	1.0	1.0	2.5	1.0	1.0	1.0
	CARBON DISULFIDE	1.0	1.0	2.5	2.0	0.5	0.5	1.3	1.0	1.0	1.0
	CARBON TETRACHLORIDE	1.0	1.0	2.5	2.0	0.5	0.5	1.3	1.0	1.0	1.0
	CHLOROBENZENE	1.0	1.0	2.5	2.0	0.5	0.5	1.3	1.0	1.0	1.0
	CHLOROETHANE	2.0	2.0	5.0	2.0	1.0	1.0	2.5	1.0	1.0	1.0
	CHLOROFORM	1.0	1.0	2.5	2.0	0.5	0.5	1.3	1.0	1.0	1.0
	CHLOROMETHANE	2.0	2.0	5.0	2.0	1.0	1.0	2.5	1.0	1.0	1.0
	CIS-1,2-DICHLOROETHENE	2.2	2.8	3.8	3.1	0.7	0.9	1.2	1.0	1.0	1.0
	CIS-1,3-DICHLOROPROPENE	1.0	1.0	2.5	2.0	0.5	0.5	1.3	1.0	1.0	1.0
	DIBROMOCHLOROMETHANE	1.0	1.0	2.5	2.0	0.5	0.5	1.3	1.0	1.0	1.0
	ETHYLBENZENE	1.0	1.0	2.5	2.0	0.5	0.5	1.3	1.0	1.0	1.0
	METHYLENE CHLORIDE	1.0	1.0	2.5	2.0	0.5	0.5	1.3	1.0	1.0	1.0
	STYRENE	1.0	1.0	2.5	2.0	0.5	0.5	1.3	1.0	1.0	1.0
	TETRACHLOROETHENE	6.7	12.0	18.0	18.0	0.4	0.7	1.0	1.0	1.0	1.0
	TOLUENE	1.0	1.0	2.5	2.0	0.5	0.5	1.3	1.0	1.0	1.0
	TRANS-1,2-DICHLOROETHENE	0.5	0.5	1.2	1.0	0.5	0.5	1.2	1.0	1.0	1.0
	TRANS-1,3-DICHLOROPROPENE	1.0	1.0	2.5	2.0	0.5	0.5	1.3	1.0	1.0	1.0
	TRICHLOROETHENE	6.2	8.5	8.6	7.7	0.8	1.1	1.1	1.0	1.0	1.0
	VINYL CHLORIDE	2.0	2.0	5.0	2.0	1.0	1.0	2.5	1.0	1.0	1.0
	XYLENES (TOTAL)	1.0	1.0	2.5	2.0	0.5	0.5	1.3	1.0	1.0	1.0
MW02-07	1,1,1-TRICHLOROETHANE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	1,1,2,2-TETRACHLOROETHANE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE			1.0	1.3	NA	NA	0.8	NA	NA	1.0
	1,1,2-TRICHLOROETHANE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	1,1-DICHLOROETHANE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	1,1-DICHLOROETHENE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	1,2-DICHLOROETHANE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	1,2-DICHLOROPROPANE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	2-BUTANONE	10.0	10.0	10.0	10.0	1.0	1.0	1.0	1.0	1.0	1.0
	2-HEXANONE	10.0	10.0	10.0	10.0	1.0	1.0	1.0	1.0	1.0	1.0
	4-METHYL-2-PENTANONE	10.0	10.0	5.0	10.0	1.0	1.0	0.5	1.0	1.0	1.0
	ACETONE	10.0	10.0	10.0	10.0	1.0	1.0	1.0	1.0	1.0	1.0
	BENZENE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	BROMODICHLOROMETHANE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	BROMOFORM	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	BROMOMETHANE	2.0	2.0	2.0	1.0	2.0	2.0	2.0	1.0	1.0	1.0
	CARBON DISULFIDE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	CARBON TETRACHLORIDE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	CHLOROBENZENE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	CHLOROETHANE	2.0	2.0	2.0	1.0	2.0	2.0	2.0	1.0	1.0	1.0
	CHLOROFORM	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	CHLOROMETHANE	2.0	2.0	2.0	1.0	2.0	2.0	2.0	1.0	1.0	1.0
	CIS-1,2-DICHLOROETHENE	0.5	0.5	0.5	0.5	1.0	1.0	1.0	1.0	1.0	1.0
	CIS-1,3-DICHLOROPROPENE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	DIBROMOCHLOROMETHANE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	ETHYLBENZENE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	METHYLENE CHLORIDE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	STYRENE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	TETRACHLOROETHENE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	TOLUENE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	TRANS-1,2-DICHLOROETHENE	0.5	0.5	0.5	0.5	1.0	1.0	1.0	1.0	1.0	1.0
	TRANS-1,3-DICHLOROPROPENE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	TRICHLOROETHENE	1.0	1.0	1.0	0.5	1.9	1.9	1.9	1.0	1.0	1.0
	VINYL CHLORIDE	2.0	2.0	2.0	1.0	2.0	2.0	2.0	1.0	1.0	1.0
	XYLENES (TOTAL)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

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Vernay Laboratories, Inc.

Plant 2/3 Facility

Project No. 0292.11.25

TABLE 4: Data Comparability and Confirmation - SVOCs and Chromium

ANALYTICAL GROUP	ANALYTE	Gen ID	Spring 1999 Event	Spring 2000 Event	Fall 2001 Event	Q3 2003 Event	Ratio 1999/2003	Ratio 2000/2003	Ratio 2001/2003	Index Value 1999/2003	Index Value 2000/2003	Index Value 2001/2003
METALS	CHROMIUM	MW01-01	0.01	0.01		0.01	1	1	NA	1	1	NA
		MW01-02	0.01	0.01		0.01	1	1	NA	1	1	NA
		MW01-02CD	0.01	0.01		0.01	1	1	NA	1	1	NA
		MW01-02SE	0.01	0.01		0.01	1	1	NA	1	1	NA
		MW01-03	0.15	0.01		0.0024	62.5	4.2	NA	0	1	NA
		MW01-03CD	0.01	0.01		0.01	1	1	NA	1	1	NA
		MW01-06	0.01	0.01		0.01	1	1	NA	1	1	NA
		MW01-07	0.01	0.01		0.011	0.9	0.9	NA	1	1	NA
		MW01-11		0.01		0.01	NA	1	NA	NA	1	NA
		MW01-12		0.01		0.012	NA	0.8	NA	NA	1	NA
		MW02-01		0.01		0.005	NA	2	NA	NA	1	NA
		MW02-02		0.01		0.005	NA	2	NA	NA	1	NA
		MW02-03		0.01		0.005	NA	2	NA	NA	1	NA
		MW02-04		0.01		0.0019	NA	5.3	NA	NA	1	NA
		MW02-05		0.01		0.005	NA	2	NA	NA	1	NA
		MW02-06		0.01		0.005	NA	2	NA	NA	1	NA
		MW02-07		0.01		0.005	NA	2	NA	NA	1	NA
SEMI-VOLATILES	2,2'-OXYBIS(1-CHLOROPROPANE)	MW01-06		10		10	NA	1	NA	NA	1	NA
	2,4,5-TRICHLOROPHENOL			10		10	NA	1	NA	NA	1	NA
	2,4,6-TRICHLOROPHENOL			10		10	NA	1	NA	NA	1	NA
	2,4-DICHLOROPHENOL			10		10	NA	1	NA	NA	1	NA
	2,4-DIMETHYLPHENOL			10		10	NA	1	NA	NA	1	NA
	2,4-DINITROPHENOL			50		50	NA	1	NA	NA	1	NA
	2,4-DINITROTOLUENE			10		10	NA	1	NA	NA	1	NA
	2,6-DINITROTOLUENE			10		10	NA	1	NA	NA	1	NA
	2-CHLORONAPHTHALENE			10		10	NA	1	NA	NA	1	NA
	2-CHLOROPHENOL			10		10	NA	1	NA	NA	1	NA
	2-METHYLNAPHTHALENE			10		10	NA	1	NA	NA	1	NA
	2-METHYLPHENOL			10		10	NA	1	NA	NA	1	NA
	2-NITROANILINE			50		50	NA	1	NA	NA	1	NA
	2-NITROPHENOL			10		10	NA	1	NA	NA	1	NA

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TABLE 4: Data Comparability and Confirmation - SVOCs and Chromium

ANALYTICAL GROUP	ANALYTE	Gen ID	Spring 1999 Event	Spring 2000 Event	Fall 2001 Event	Q3 2003 Event	Ratio 1999/2003	Ratio 2000/2003	Ratio 2001/2003	Index Value 1999/2003	Index Value 2000/2003	Index Value 2001/2003
SEMI-VOLATILES	3,3'-DICHLOROBENZIDINE	MW01-06		50		50	NA	1	NA	NA	1	NA
	3-NITROANILINE			50		50	NA	1	NA	NA	1	NA
	4,6-DINITRO-2-METHYLPHENOL			50		50	NA	1	NA	NA	1	NA
	4-BROMOPHENYL PHENYL ETHER			10		10	NA	1	NA	NA	1	NA
	4-CHLORO-3-METHYLPHENOL			10		10	NA	1	NA	NA	1	NA
	4-CHLOROANILINE			10		10	NA	1	NA	NA	1	NA
	4-CHLOROPHENYL PHENYL ETHER			10		10	NA	1	NA	NA	1	NA
	4-METHYLPHENOL			10		10	NA	1	NA	NA	1	NA
	4-NITROANILINE			50		50	NA	1	NA	NA	1	NA
	4-NITROPHENOL			50		50	NA	1	NA	NA	1	NA
	ACENAPHTHENE			10		10	NA	1	NA	NA	1	NA
	ACENAPHTHYLENE			10		10	NA	1	NA	NA	1	NA
	ANTHRACENE			10		10	NA	1	NA	NA	1	NA
	BENZO(A)ANTHRACENE			10		10	NA	1	NA	NA	1	NA
	BENZO(A)PYRENE			10		10	NA	1	NA	NA	1	NA
	BENZO(B)FLUORANTHENE			10		10	NA	1	NA	NA	1	NA
	BENZO(GHI)PERYLENE			10		10	NA	1	NA	NA	1	NA
	BENZO(K)FLUORANTHENE			10		10	NA	1	NA	NA	1	NA
	BIS(2-CHLOROETHOXY)METHANE			10		10	NA	1	NA	NA	1	NA
	BIS(2-CHLOROETHYL) ETHER			10		10	NA	1	NA	NA	1	NA
	BIS(2-ETHYLHEXYL) PHTHALATE			10		10	NA	1	NA	NA	1	NA
	BUTYL BENZYL PHTHALATE			10		10	NA	1	NA	NA	1	NA
	CARBAZOLE			10		10	NA	1	NA	NA	1	NA
	CHRYSENE			10		10	NA	1	NA	NA	1	NA
	DIBENZ(A,H)ANTHRACENE			10		10	NA	1	NA	NA	1	NA
	DIBENZOFURAN			10		10	NA	1	NA	NA	1	NA
	DIETHYL PHTHALATE			10		10	NA	1	NA	NA	1	NA
	DIMETHYL PHTHALATE			10		10	NA	1	NA	NA	1	NA
	DI-N-BUTYL PHTHALATE			10		10	NA	1	NA	NA	1	NA
	DI-N-OCTYL PHTHALATE			10		10	NA	1	NA	NA	1	NA
	FLUORANTHENE			10		10	NA	1	NA	NA	1	NA
	FLUORENE			10		10	NA	1	NA	NA	1	NA
	HEXACHLOROBENZENE			10		10	NA	1	NA	NA	1	NA
	HEXACHLOROBUTADIENE			10		10	NA	1	NA	NA	1	NA
	HEXACHLOROCYCLOPENTADIENE			50		50	NA	1	NA	NA	1	NA
	HEXACHLOROETHANE			10		10	NA	1	NA	NA	1	NA

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TABLE 4: Data Comparability and Confirmation - SVOCs and Chromium

ANALYTICAL GROUP	ANALYTE	Gen ID	Spring 1999 Event	Spring 2000 Event	Fall 2001 Event	Q3 2003 Event	Ratio 1999/2003	Ratio 2000/2003	Ratio 2001/2003	Index Value 1999/2003	Index Value 2000/2003	Index Value 2001/2003
SEMI-VOLATILES	INDENO(1,2,3-CD)PYRENE	MW01-06		10		10	NA	1	NA	NA	1	NA
	ISOPHORONE			10		10	NA	1	NA	NA	1	NA
	NAPHTHALENE			10		10	NA	1	NA	NA	1	NA
	NITROBENZENE			10		10	NA	1	NA	NA	1	NA
	N-NITROSODI-N-PROPYLAMINE			10		10	NA	1	NA	NA	1	NA
	N-NITROSODIPHENYLAMINE			10		10	NA	1	NA	NA	1	NA
	PENTACHLOROPHENOL			10		10	NA	1	NA	NA	1	NA
	PHENANTHRENE			10		10	NA	1	NA	NA	1	NA
	PHENOL			10		10	NA	1	NA	NA	1	NA
	PYRENE			10		10	NA	1	NA	NA	1	NA
	2,2'-OXYBIS(1-CHLOROPROPANE)	MW01-07		10		10	NA	1	NA	NA	1	NA
	2,4,5-TRICHLOROPHENOL			10		10	NA	1	NA	NA	1	NA
	2,4,6-TRICHLOROPHENOL			10		10	NA	1	NA	NA	1	NA
	2,4-DICHLOROPHENOL			10		10	NA	1	NA	NA	1	NA
	2,4-DIMETHYLPHENOL			10		10	NA	1	NA	NA	1	NA
	2,4-DINITROPHENOL			50		50	NA	1	NA	NA	1	NA
	2,4-DINITROTOLUENE			10		10	NA	1	NA	NA	1	NA
	2,6-DINITROTOLUENE			10		10	NA	1	NA	NA	1	NA
	2-CHLORONAPHTHALENE			10		10	NA	1	NA	NA	1	NA
	2-CHLOROPHENOL			10		10	NA	1	NA	NA	1	NA
	2-METHYLNAPHTHALENE			10		10	NA	1	NA	NA	1	NA
	2-METHYLPHENOL			10		10	NA	1	NA	NA	1	NA
	2-NITROANILINE			50		50	NA	1	NA	NA	1	NA
	2-NITROPHENOL			10		10	NA	1	NA	NA	1	NA
	3,3'-DICHLOROBENZIDINE			50		50	NA	1	NA	NA	1	NA
	3-NITROANILINE			50		50	NA	1	NA	NA	1	NA
	4,6-DINITRO-2-METHYLPHENOL			50		50	NA	1	NA	NA	1	NA
	4-BROMOPHENYL PHENYL ETHER			10		10	NA	1	NA	NA	1	NA
	4-CHLORO-3-METHYLPHENOL			10		10	NA	1	NA	NA	1	NA
	4-CHLOROANILINE			10		10	NA	1	NA	NA	1	NA
	4-CHLOROPHENYL PHENYL ETHER			10		10	NA	1	NA	NA	1	NA
	4-METHYLPHENOL			10		10	NA	1	NA	NA	1	NA
	4-NITROANILINE			50		50	NA	1	NA	NA	1	NA
	4-NITROPHENOL			50		50	NA	1	NA	NA	1	NA
	ACENAPHTHENE			10		10	NA	1	NA	NA	1	NA
	ACENAPHTHYLENE			10		10	NA	1	NA	NA	1	NA

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TABLE 4: Data Comparability and Confirmation - SVOCs and Chromium

ANALYTICAL GROUP	ANALYTE	Gen ID	Spring 1999 Event	Spring 2000 Event	Fall 2001 Event	Q3 2003 Event	Ratio 1999/2003	Ratio 2000/2003	Ratio 2001/2003	Index Value 1999/2003	Index Value 2000/2003	Index Value 2001/2003
SEMI-VOLATILES	ANTHRACENE	MW01-07		10		10	NA	1	NA	NA	1	NA
	BENZO(A)ANTHRACENE			10		10	NA	1	NA	NA	1	NA
	BENZO(A)PYRENE			10		10	NA	1	NA	NA	1	NA
	BENZO(B)FLUORANTHENE			10		10	NA	1	NA	NA	1	NA
	BENZO(GHI)PERYLENE			10		10	NA	1	NA	NA	1	NA
	BENZO(K)FLUORANTHENE			10		10	NA	1	NA	NA	1	NA
	BIS(2-CHLOROETHOXY)METHANE			10		10	NA	1	NA	NA	1	NA
	BIS(2-CHLOROETHYL) ETHER			10		10	NA	1	NA	NA	1	NA
	BIS(2-ETHYLHEXYL) PHTHALATE			10		10	NA	1	NA	NA	1	NA
	BUTYL BENZYL PHTHALATE			10		10	NA	1	NA	NA	1	NA
	CARBAZOLE			10		10	NA	1	NA	NA	1	NA
	CHRYSENE			10		10	NA	1	NA	NA	1	NA
	DIBENZ(A,H)ANTHRACENE			10		10	NA	1	NA	NA	1	NA
	DIBENZOFURAN			10		10	NA	1	NA	NA	1	NA
	DIETHYL PHTHALATE			10		10	NA	1	NA	NA	1	NA
	DIMETHYL PHTHALATE			10		10	NA	1	NA	NA	1	NA
	DI-N-BUTYL PHTHALATE			10		10	NA	1	NA	NA	1	NA
	DI-N-OCTYL PHTHALATE			10		10	NA	1	NA	NA	1	NA
	FLUORANTHENE			10		10	NA	1	NA	NA	1	NA
	FLUORENE			10		10	NA	1	NA	NA	1	NA
	HEXACHLOROBENZENE			10		10	NA	1	NA	NA	1	NA
	HEXACHLOROBUTADIENE			10		10	NA	1	NA	NA	1	NA
	HEXACHLOROCYCLOPENTADIENE			50		50	NA	1	NA	NA	1	NA
	HEXACHLOROETHANE			10		10	NA	1	NA	NA	1	NA
	INDENO(1,2,3-CD)PYRENE			10		10	NA	1	NA	NA	1	NA
	ISOPHORONE			10		10	NA	1	NA	NA	1	NA
	NAPHTHALENE			10		10	NA	1	NA	NA	1	NA
	NITROBENZENE			10		10	NA	1	NA	NA	1	NA
	N-NITROSODI-N-PROPYLAMINE			10		10	NA	1	NA	NA	1	NA
	N-NITROSODIPHENYLAMINE			10		10	NA	1	NA	NA	1	NA
	PENTACHLOROPHENOL			10		10	NA	1	NA	NA	1	NA
	PHENANTHRENE			10		10	NA	1	NA	NA	1	NA
	PHENOL			10		10	NA	1	NA	NA	1	NA
	PYRENE			10		10	NA	1	NA	NA	1	NA
	2,2'-OXYBIS(1-CHLOROPROPANE)	MW01-11		10		10	NA	1	NA	NA	1	NA
	2,4,5-TRICHLOROPHENOL			10		10	NA	1	NA	NA	1	NA

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TABLE 4: Data Comparability and Confirmation - SVOCs and Chromium

ANALYTICAL GROUP	ANALYTE	Gen ID	Spring 1999 Event	Spring 2000 Event	Fall 2001 Event	Q3 2003 Event	Ratio 1999/2003	Ratio 2000/2003	Ratio 2001/2003	Index Value 1999/2003	Index Value 2000/2003	Index Value 2001/2003
SEMI-VOLATILES	2,4,6-TRICHLOROPHENOL	MW01-11		10		10	NA	1	NA	NA	1	NA
	2,4-DICHLOROPHENOL			10		10	NA	1	NA	NA	1	NA
	2,4-DIMETHYLPHENOL			10		10	NA	1	NA	NA	1	NA
	2,4-DINITROPHENOL			50		50	NA	1	NA	NA	1	NA
	2,4-DINITROTOLUENE			10		10	NA	1	NA	NA	1	NA
	2,6-DINITROTOLUENE			10		10	NA	1	NA	NA	1	NA
	2-CHLORONAPHTHALENE			10		10	NA	1	NA	NA	1	NA
	2-CHLOROPHENOL			10		10	NA	1	NA	NA	1	NA
	2-METHYLNAPHTHALENE			10		10	NA	1	NA	NA	1	NA
	2-METHYLPHENOL			10		10	NA	1	NA	NA	1	NA
	2-NITROANILINE			50		50	NA	1	NA	NA	1	NA
	2-NITROPHENOL			10		10	NA	1	NA	NA	1	NA
	3,3'-DICHLOROBENZIDINE			50		50	NA	1	NA	NA	1	NA
	3-NITROANILINE			50		50	NA	1	NA	NA	1	NA
	4,6-DINITRO-2-METHYLPHENOL			50		50	NA	1	NA	NA	1	NA
	4-BROMOPHENYL PHENYL ETHER			10		10	NA	1	NA	NA	1	NA
	4-CHLORO-3-METHYLPHENOL			10		10	NA	1	NA	NA	1	NA
	4-CHLOROANILINE			10		10	NA	1	NA	NA	1	NA
	4-CHLOROPHENYL PHENYL ETHER			10		10	NA	1	NA	NA	1	NA
	4-METHYLPHENOL			10		10	NA	1	NA	NA	1	NA
	4-NITROANILINE			50		50	NA	1	NA	NA	1	NA
	4-NITROPHENOL			50		50	NA	1	NA	NA	1	NA
	ACENAPHTHENE			10		10	NA	1	NA	NA	1	NA
	ACENAPHTHYLENE			10		10	NA	1	NA	NA	1	NA
	ANTHRACENE			10		10	NA	1	NA	NA	1	NA
	BENZO(A)ANTHRACENE			10		10	NA	1	NA	NA	1	NA
	BENZO(A)PYRENE			10		10	NA	1	NA	NA	1	NA
	BENZO(B)FLUORANTHENE			10		10	NA	1	NA	NA	1	NA
	BENZO(GHI)PERYLENE			10		10	NA	1	NA	NA	1	NA
	BENZO(K)FLUORANTHENE			10		10	NA	1	NA	NA	1	NA
	BIS(2-CHLOROETHOXY)METHANE			10		10	NA	1	NA	NA	1	NA
	BIS(2-CHLOROETHYL) ETHER			10		10	NA	1	NA	NA	1	NA
	BIS(2-ETHYLHEXYL) PHTHALATE			10		10	NA	1	NA	NA	1	NA
	BUTYL BENZYL PHTHALATE			10		10	NA	1	NA	NA	1	NA
	CARBAZOLE			10		10	NA	1	NA	NA	1	NA
	CHRYSENE			10		10	NA	1	NA	NA	1	NA

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TABLE 4: Data Comparability and Confirmation - SVOCs and Chromium

ANALYTICAL GROUP	ANALYTE	Gen ID	Spring 1999 Event	Spring 2000 Event	Fall 2001 Event	Q3 2003 Event	Ratio 1999/2003	Ratio 2000/2003	Ratio 2001/2003	Index Value 1999/2003	Index Value 2000/2003	Index Value 2001/2003
SEMI-VOLATILES	DIBENZ(A,H)ANTHRACENE	MW01-11		10		10	NA	1	NA	NA	1	NA
	DIBENZOFURAN			10		10	NA	1	NA	NA	1	NA
	DIETHYL PHTHALATE			10		10	NA	1	NA	NA	1	NA
	DIMETHYL PHTHALATE			10		10	NA	1	NA	NA	1	NA
	DI-N-BUTYL PHTHALATE			10		10	NA	1	NA	NA	1	NA
	DI-N-OCTYL PHTHALATE			10		10	NA	1	NA	NA	1	NA
	FLUORANTHENE			10		10	NA	1	NA	NA	1	NA
	FLUORENE			10		10	NA	1	NA	NA	1	NA
	HEXACHLOROBENZENE			10		10	NA	1	NA	NA	1	NA
	HEXACHLOROBUTADIENE			10		10	NA	1	NA	NA	1	NA
	HEXACHLOROCYCLOPENTADIENE			50		50	NA	1	NA	NA	1	NA
	HEXACHLOROETHANE			10		10	NA	1	NA	NA	1	NA
	INDENO(1,2,3-CD)PYRENE			10		10	NA	1	NA	NA	1	NA
	ISOPHORONE			10		10	NA	1	NA	NA	1	NA
	NAPHTHALENE			10		10	NA	1	NA	NA	1	NA
	NITROBENZENE			10		10	NA	1	NA	NA	1	NA
	N-NITROSODI-N-PROPYLAMINE			10		10	NA	1	NA	NA	1	NA
	N-NITROSODIPHENYLAMINE			10		10	NA	1	NA	NA	1	NA
	PENTACHLOROPHENOL			10		10	NA	1	NA	NA	1	NA
	PHENANTHRENE			10		10	NA	1	NA	NA	1	NA
	PHENOL			10		10	NA	1	NA	NA	1	NA
	PYRENE			10		10	NA	1	NA	NA	1	NA

NA = Not Applicable

APPENDIX VIII

SURFACE WATER AND SEDIMENT DATA COMPARISON

APPENDIX VIII

COMPARISON OF OHIO VAP INVESTIGATION SURFACE WATER AND SEDIMENT DATA AND RCRA CORRECTIVE ACTION DATA

Ohio VAP investigation surface water and sediment analytical data were compared to RCRA Corrective Action analytical data. The purpose of this comparison was to: 1) determine if there is significant variability in the laboratory method reporting limits; and, 2) determine if there is significant variability in the sample concentrations between the historic data and the recent data. The empirical methods for comparing confirmatory data with historical data presented in US EPA guidance (US EPA, 1998) were used.

The confirmatory data that was used for these comparisons included surface water and sediment laboratory data collected during the First and Fourth Quarterly Monitoring Events, respectively. This data is appropriate for use as confirmatory data since the data was collected in conformance with the Project QAPP (Payne Firm, 2003). The confirmatory surface water and sediment samples were collected from the same locations as the Ohio VAP investigation data.

The Ohio VAP investigation surface water data collected consisted of eight sampling events conducted between January 1999 and November 2001. These sampling events included the collection of surface water at several locations in an unnamed creek located east of the Facility. The Ohio VAP investigation sediment data collected consisted of seven sampling events conducted between March 1999 and November 2001. These sampling events included the collection of sediment at several locations within the unnamed creek. The surface water and sediment sampling events were conducted as part of the Ohio VAP investigation at the Facility. A summary of these sampling events, as well as the analytical laboratory results was presented in the CCR (Payne Firm, 2002).

The comparisons of the Ohio VAP investigation data to the confirmatory data was conducted for VOC constituents identified in the Project QAPP and in the Technical Memorandum No. 1 (Payne Firm, 2003). During the RCRA Corrective Action, a surface water sample was collected from the unnamed creek during the first quarter monitoring event. This surface water sample was collected at location ST02-05, which is the same location where previous surface water samples were collected during the Ohio VAP investigations. During the fourth quarter monitoring event in 2003, a sediment sample was collected from within the unnamed creek at location SED02-01. Sediment samples were collected from this same location during the Ohio VAP investigations.

Some VOC constituents were not analyzed during the Ohio VAP investigation sampling events, and were therefore not assessed during this comparison. The VOCs that were not analyzed during the Ohio VAP investigation sampling events include: 1,2,4-trichlorobenzene; 1,2-dibromo-3-chloropropane; 1,2-dibromoethane; 1,2-dichlorobenzene; 1,3-dichlorobenzene; 1,4-dichlorobenzene; cyclohexane;

dichlorodifluoromethane; isopropylbenzene; methyl acetate; methyl tert-butyl ether; methylcyclohexane; and trichlorofluoromethane.

Laboratory Method Reporting Limits Comparability

The variability of the laboratory method reporting limits (MRLs) between the Ohio VAP investigation and confirmatory data was assessed. This assessment was conducted by comparing the ratio of the MRLs of the Ohio VAP investigation data with that of the confirmatory data. For the purpose of this comparison, the minimum, maximum, and average MRLs were determined for each constituent from the Ohio VAP investigation surface water and sediment sampling events. The MRLs from the confirmatory ground water data were also determined. The average Ohio VAP MRLs were then compared to the confirmatory MRLs by determining the ratio of the Ohio VAP MRLs to the confirmatory MRLs. Ratios greater than 2 were assigned an index value of "0", and ratios equal to or less than 2 were assigned an index value of "1". A summary of this comparison is presented on Table 1 and Table 2 of this attachment.

A comparison of the number of locations and constituents having an index of 1 to those having an index of 0 was conducted. For the surface water, VOCs collected at ST02-05, 31 VOCs (89%) have an index of 1, and 4 VOCs (11%) have an index of 0. The VOCs that were assigned an index value of 0 included: bromomethane, chloroethane, chloromethane, and vinyl chloride. Since more than 80% of the values were assigned an index of 1, the Ohio VAP investigation surface water data and the confirmation data sets have basically the same MDL. For the sediment, VOCs collected at SED02-01, 31 VOCs (79%) have an index of 1, and 8 VOCs (21%) have an index of 0. The VOCs that were assigned an index value of 0 included: 1,2,4-trichlorobenzene; 1,2-dichlorobenzene; 1,3-dichlorobenzene; 1,4-dichlorobenzene; bromomethane; chloroethane; chloromethane; and vinyl chloride. Although slightly less than 80% (79%) of the values were assigned an index of 1, the Ohio VAP investigation sediment data and the confirmation data sets have basically the same MDL.

Data Comparability and Confirmation

Since the MRLs for the Ohio VAP investigation surface water and sediment data and confirmatory data are considered acceptable, a comparison of the reported hazardous constituent concentrations obtained in the Ohio VAP investigation data to those of the confirmatory data was conducted. For surface water, three Ohio VAP ground water sampling events from the Spring 1999, Spring 2000, and Fall 2001 for ST02-05 were each compared separately to the data collected from same location from the first quarter 2003 RCRA Corrective Action monitoring event. For sediment, three Ohio VAP investigation sediment sampling events from December 1999, November 2000, and November 2001 for SED02-01 were each compared separately to the data collected from the same location from the fourth quarter 2003 RCRA Corrective Action monitoring event. The sediment data used for this comparison is appropriate since the Ohio VAP investigation sediment data was collected during a similar time period (late fall) as the RCRA sampling event.

For each hazardous constituent of concern, the ratio of the concentration from the Ohio VAP investigation data to the concentration from the confirmatory data was determined. The reporting limit was used if a constituent was not detected by the laboratory (US EPA, 1998). If the ratio was determined to be between 0.1 and 10, then an index value of "1" was assigned to the location/constituent. If the ratio was determined to be either greater than 10 or less than 0.1, then an index value of "0" was assigned to the location/constituent. A summary of this comparison is presented on Tables 3 and 4 of this appendix.

A comparison of the number of locations/constituents having an index of 1 to those having an index of 0 was conducted. For the surface water and sediment VOCs from ST02-05 and SED02-01, respectively, all constituents have an index value of 1.

Summary

The methods for comparing Ohio VAP and confirmatory surface water and sediment data were conducted following US EPA guidance (US EPA, 1998). The results of this assessment indicate that there is no significant variability between the MDLs and in the sample concentrations between the Ohio VAP investigation surface water and sediment data and the confirmatory surface water and sediment data collected during the RCRA Corrective Action.

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Plant 2/3 Facility

Project No. 0292.11.25

TABLE 1: Method Reporting Limit Comparison-Surface Water VOCs

Gen ID	ANALYTE	UNITS	pre2003			Feb-03	ratio[1]	Index Value
			MRL_{min}	MRL_{max}	MRL_{avg}	MRL		
ST02-05	1,1,1-TRICHLOROETHANE	UG/L	1	2.5	1.64	1	1.6375	1
ST02-05	1,1,2,2-TETRACHLOROETHANE	UG/L	1	2.5	1.64	1	1.6375	1
ST02-05	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	UG/L	1	2.5	1.50	1	1.5	1
ST02-05	1,1,2-TRICHLOROETHANE	UG/L	1	2.5	1.64	1	1.6375	1
ST02-05	1,1-DICHLOROETHANE	UG/L	1	2.5	1.64	1	1.6375	1
ST02-05	1,1-DICHLOROETHENE	UG/L	1	2.5	1.64	1	1.6375	1
ST02-05	1,2-DICHLOROETHANE	UG/L	1	2.5	1.51	1	1.51428571	1
ST02-05	1,2-DICHLOROPROPANE	UG/L	1	2.5	1.64	1	1.6375	1
ST02-05	2-BUTANONE	UG/L	10	25	16.38	10	1.6375	1
ST02-05	2-HEXANONE	UG/L	10	25	16.38	10	1.6375	1
ST02-05	4-METHYL-2-PENTANONE	UG/L	5	25	13.50	10	1.35	1
ST02-05	ACETONE	UG/L	10	25	16.38	10	1.6375	1
ST02-05	BENZENE	UG/L	1	2.5	1.64	1	1.6375	1
ST02-05	BROMODICHLOROMETHANE	UG/L	1	2.5	1.64	1	1.6375	1
ST02-05	BROMOFORM	UG/L	1	2.5	1.64	1	1.6375	1
ST02-05	BROMOMETHANE	UG/L	2	5	3.29	1	3.2875	0
ST02-05	CARBON DISULFIDE	UG/L	1	2.5	1.64	1	1.6375	1
ST02-05	CARBON TETRACHLORIDE	UG/L	1	2.5	1.64	1	1.6375	1
ST02-05	CHLOROBENZENE	UG/L	1	2.5	1.64	1	1.6375	1
ST02-05	CHLOROETHANE	UG/L	2	5	3.29	1	3.2875	0

TABLE 1: Method Reporting Limit Comparison-Surface Water VOCs

Gen ID	ANALYTE	UNITS	pre2003			Feb-03	ratio[1]	Index Value
			MRL_{min}	MRL_{max}	MRL_{avg}	MRL		
ST02-05	CHLOROFORM	UG/L	1	2.5	1.64	1	1.6375	1
ST02-05	CHLOROMETHANE	UG/L	2	5	3.29	1	3.2875	0
ST02-05	CIS-1,2-DICHLOROETHENE	UG/L	0.5	1.2	0.80	0.5	1.6075	1
ST02-05	CIS-1,3-DICHLOROPROPENE	UG/L	1	2.5	1.64	1	1.6375	1
ST02-05	DIBROMOCHLOROMETHANE	UG/L	1	2.5	1.64	1	1.6375	1
ST02-05	ETHYLBENZENE	UG/L	1	2.5	1.64	1	1.6375	1
ST02-05	METHYLENE CHLORIDE	UG/L	1	2.5	1.64	1	1.6375	1
ST02-05	STYRENE	UG/L	1	2.5	1.64	1	1.6375	1
ST02-05	TETRACHLOROETHENE	UG/L	1	2.5	1.64	1	1.6375	1
ST02-05	TOLUENE	UG/L	1	2.5	1.64	1	1.6375	1
ST02-05	TRANS-1,2-DICHLOROETHENE	UG/L	0.5	1.2	0.80	0.5	1.6075	1
ST02-05	TRANS-1,3-DICHLOROPROPENE	UG/L	1	2.5	1.64	1	1.6375	1
ST02-05	TRICHLOROETHENE	UG/L	1	2.5	1.64	1	1.6375	1
ST02-05	VINYL CHLORIDE	UG/L	2	5	3.29	1	3.2875	0
ST02-05	XYLENES (TOTAL)	UG/L	1	2.5	1.64	1	1.6375	1

[1] ratio was determined by dividing the MRL_{avg} for the pre 2003 data by the MRL for the data collected in February 2003

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TABLE 2: Method Reporting Limit Comparison-Sediment VOCs

Gen ID	ANALYTE	UNITS	Pre-2003			Nov-03	ratio[1]	Index Value
			MRL_{min}	MRL_{max}	MRL_{avg}	MRL		
SED02-01	1,1,1-TRICHLOROETHANE	UG/KG	5	16	7.8	6.3	1.2	1
SED02-01	1,1,2,2-TETRACHLOROETHANE	UG/KG	5	16	7.8	6.3	1.2	1
SED02-01	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	UG/KG	5.8	11	7.6	6.3	1.2	1
SED02-01	1,1,2-TRICHLOROETHANE	UG/KG	5	16	7.8	6.3	1.2	1
SED02-01	1,1-DICHLOROETHANE	UG/KG	5	16	7.8	6.3	1.2	1
SED02-01	1,1-DICHLOROETHENE	UG/KG	5	16	7.8	6.3	1.2	1
SED02-01	1,2,4-TRICHLOROBENZENE	UG/KG	12	32	18.7	6.3	3.0	0
SED02-01	1,2-DICHLOROBENZENE	UG/KG	12	32	18.7	6.3	3.0	0
SED02-01	1,2-DICHLOROETHANE	UG/KG	5	16	7.8	6.3	1.2	1
SED02-01	1,2-DICHLOROPROPANE	UG/KG	5	16	7.8	6.3	1.2	1
SED02-01	1,3-DICHLOROBENZENE	UG/KG	12	32	18.7	6.3	3.0	0
SED02-01	1,4-DICHLOROBENZENE	UG/KG	12	32	18.7	6.3	3.0	0
SED02-01	2-BUTANONE	UG/KG	20	63	31.3	25	1.3	1
SED02-01	2-HEXANONE	UG/KG	20	63	31.3	25	1.3	1
SED02-01	4-METHYL-2-PENTANONE	UG/KG	20	63	31.3	25	1.3	1
SED02-01	ACETONE	UG/KG	20	63	31.3	25	1.3	1
SED02-01	BENZENE	UG/KG	5	16	7.8	6.3	1.2	1
SED02-01	BROMODICHLOROMETHANE	UG/KG	5	16	7.8	6.3	1.2	1
SED02-01	BROMOFORM	UG/KG	5	16	7.8	6.3	1.2	1
SED02-01	BROMOMETHANE	UG/KG	10	32	15.7	6.3	2.5	0
SED02-01	CARBON DISULFIDE	UG/KG	5	16	7.8	6.3	1.2	1

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TABLE 2: Method Reporting Limit Comparison-Sediment VOCs

Gen ID	ANALYTE	UNITS	Pre-2003			Nov-03	ratio[1]	Index Value
			MRL_{min}	MRL_{max}	MRL_{avg}	MRL		
SED02-01	CARBON TETRACHLORIDE	UG/KG	5	16	7.8	6.3	1.2	1
SED02-01	CHLOROBENZENE	UG/KG	5	16	7.8	6.3	1.2	1
SED02-01	CHLOROETHANE	UG/KG	10	32	15.7	6.3	2.5	0
SED02-01	CHLOROFORM	UG/KG	5	16	7.8	6.3	1.2	1
SED02-01	CHLOROMETHANE	UG/KG	10	32	15.7	6.3	2.5	0
SED02-01	CIS-1,2-DICHLOROETHENE	UG/KG	2.5	7.9	3.9	3.2	1.2	1
SED02-01	CIS-1,3-DICHLOROPROPENE	UG/KG	5	16	7.8	6.3	1.2	1
SED02-01	DIBROMOCHLOROMETHANE	UG/KG	5	16	7.8	6.3	1.2	1
SED02-01	ETHYLBENZENE	UG/KG	5	16	7.8	6.3	1.2	1
SED02-01	METHYLENE CHLORIDE	UG/KG	5	16	7.8	6.3	1.2	1
SED02-01	STYRENE	UG/KG	5	16	7.8	6.3	1.2	1
SED02-01	TETRACHLOROETHENE	UG/KG	5	16	7.8	6.3	1.2	1
SED02-01	TOLUENE	UG/KG	5	16	7.8	6.3	1.2	1
SED02-01	TRANS-1,2-DICHLOROETHENE	UG/KG	2.5	7.9	3.9	3.2	1.2	1
SED02-01	TRANS-1,3-DICHLOROPROPENE	UG/KG	5	16	7.8	6.3	1.2	1
SED02-01	TRICHLOROETHENE	UG/KG	5	16	7.8	6.3	1.2	1
SED02-01	VINYL CHLORIDE	UG/KG	10	32	15.7	6.3	2.5	0
SED02-01	XYLENES (TOTAL)	UG/KG	5	23	11.0	6.3	1.7	1

[1] ratio was determined by dividing the MRL_{avg} for the pre 2003 data by the MRL for the data collected in November 2003

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TABLE 3: Data Comparibility and Confirmation--Surface Water VOCs

Gen ID	ANALYTE	UNITS	Spring 1999 Event	Spring 2000 Event	Fall 2001 Event	Q3 2003 Event	Ratio 1999/2003	Ratio 2000/2003	Ratio 2001/2003	Index Value 1999/2003	Index Value 2000/2003	Index Value 2001/ 2003
ST02-05	1,1,1-TRICHLOROETHANE	UG/L	2.5	1.4	2.5	1	2.5	1.4	2.5	1	1	1
ST02-05	1,1,2,2-TETRACHLOROETHANE	UG/L	2.5	1.4	2.5	1	2.5	1.4	2.5	1	1	1
ST02-05	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	UG/L	NA	NA	2.5	1	NA	NA	2.5	NA	NA	1
ST02-05	1,1,2-TRICHLOROETHANE	UG/L	2.5	1.4	2.5	1	2.5	1.4	2.5	1	1	1
ST02-05	1,1-DICHLOROETHANE	UG/L	2.5	1.4	2.5	1	2.5	1.4	2.5	1	1	1
ST02-05	1,1-DICHLOROETHENE	UG/L	2.5	1.4	2.5	1	2.5	1.4	2.5	1	1	1
ST02-05	1,2-DICHLOROETHANE	UG/L	2.5	1.4	2.5	1	2.5	1.4	2.5	1	1	1
ST02-05	1,2-DICHLOROPROPANE	UG/L	2.5	1.4	2.5	1	2.5	1.4	2.5	1	1	1
ST02-05	2-BUTANONE	UG/L	25	14	25	10	2.5	1.4	2.5	1	1	1
ST02-05	2-HEXANONE	UG/L	25	14	25	10	2.5	1.4	2.5	1	1	1
ST02-05	4-METHYL-2-PENTANONE	UG/L	25	14	12	10	2.5	1.4	1.2	1	1	1
ST02-05	ACETONE	UG/L	25	14	25	10	2.5	1.4	2.5	1	1	1
2-05	BENZENE	UG/L	2.5	1.4	2.5	1	2.5	1.4	2.5	1	1	1
S02-05	BROMODICHLOROMETHANE	UG/L	2.5	1.4	2.5	1	2.5	1.4	2.5	1	1	1
ST02-05	BROMOFORM	UG/L	2.5	1.4	2.5	1	2.5	1.4	2.5	1	1	1
ST02-05	BROMOMETHANE	UG/L	5	2.8	5	1	5	2.8	5	1	1	1
ST02-05	CARBON DISULFIDE	UG/L	2.5	1.4	2.5	1	2.5	1.4	2.5	1	1	1
ST02-05	CARBON TETRACHLORIDE	UG/L	2.5	1.4	2.5	1	2.5	1.4	2.5	1	1	1
ST02-05	CHLOROBENZENE	UG/L	2.5	1.4	2.5	1	2.5	1.4	2.5	1	1	1
ST02-05	CHLOROETHANE	UG/L	5	2.8	5	1	5	2.8	5	1	1	1
ST02-05	CHLOROFORM	UG/L	2.5	1.4	2.5	1	2.5	1.4	2.5	1	1	1
ST02-05	CHLOROMETHANE	UG/L	5	2.8	5	1	5	2.8	5	1	1	1
ST02-05	CIS-1,2-DICHLOROETHENE	UG/L	1.2	0.71	1.2	0.78	1.5	0.9	1.5	1	1	1
ST02-05	CIS-1,3-DICHLOROPROPENE	UG/L	2.5	1.4	2.5	1	2.5	1.4	2.5	1	1	1
ST02-05	DIBROMOCHLOROMETHANE	UG/L	2.5	1.4	2.5	1	2.5	1.4	2.5	1	1	1
ST02-05	ETHYLBENZENE	UG/L	2.5	1.4	2.5	1	2.5	1.4	2.5	1	1	1
ST02-05	METHYLENE CHLORIDE	UG/L	2.5	1.4	2.5	1	2.5	1.4	2.5	1	1	1
ST02-05	STYRENE	UG/L	2.5	1.4	2.5	1	2.5	1.4	2.5	1	1	1
ST02-05	TETRACHLOROETHENE	UG/L	54	28	75	39	1.4	0.7	1.9	1	1	1
ST02-05	TOLUENE	UG/L	2.5	1.4	2.5	1	2.5	1.4	2.5	1	1	1
ST02-05	TRANS-1,2-DICHLOROETHENE	UG/L	1.2	0.71	1.2	0.5	2.4	1.42	2.4	1	1	1
ST02-05	TRANS-1,3-DICHLOROPROPENE	UG/L	2.5	1.4	2.5	1	2.5	1.4	2.5	1	1	1
ST02-05	TRICHLOROETHENE	UG/L	2.5	1.4	2.5	0.9	2.8	1.6	2.8	1	1	1
ST02-05	VINYL CHLORIDE	UG/L	5	2.8	5	1	5	2.8	5	1	1	1
ST02-05	XYLENES (TOTAL)	UG/L	2.5	1.4	2.5	1	2.5	1.4	2.5	1	1	1

NA = Not Applicable

6c/amu
12/11/2003

TABLE 4: Data Comparibility and Confirmation--Sediment VOCs

Gen ID	ANALYTE	UNITS	Fall 1999 Event	Fall 2000 Event	Fall 2001 Event	Q4 2003 Event	Ratio 1999/2003	Ratio 2000/2003	Ratio 2001/2003	Index Value 1999/2003	Index Value 2000/2003	Index Value 2001/2003
SED02-01	1,1,1-TRICHLOROETHANE	UG/KG	5.2	5.9	11	6.3	0.8	0.9	1.7	1	1	1
SED02-01	1,1,2,2-TETRACHLOROETHANE	UG/KG	5.2	5.9	11	6.3	0.8	0.9	1.7	1	1	1
SED02-01	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	UG/KG	NA	5.9	11	6.3	NA	0.9	1.7	NA	1	1
SED02-01	1,1,2-TRICHLOROETHANE	UG/KG	5.2	5.9	11	6.3	0.8	0.9	1.7	1	1	1
SED02-01	1,1-DICHLOROETHANE	UG/KG	5.2	5.9	11	6.3	0.8	0.9	1.7	1	1	1
SED02-01	1,1-DICHLOROETHENE	UG/KG	5.2	5.9	11	6.3	0.8	0.9	1.7	1	1	1
SED02-01	1,2,4-TRICHLOROBENZENE	UG/KG	NA	12	NA	6.3	NA	1.9	NA	NA	1	NA
SED02-01	1,2-DIBROMO-3-CHLOROPROPANE	UG/KG	NA	NA	NA	13	NA	NA	NA	NA	NA	NA
SED02-01	1,2-DIBROMOETHANE	UG/KG	NA	NA	NA	6.3	NA	NA	NA	NA	NA	NA
SED02-01	1,2-DICHLOROBENZENE	UG/KG	NA	12	NA	6.3	NA	1.9	NA	NA	1	NA
SED02-01	1,2-DICHLOROETHANE	UG/KG	5.2	5.9	11	6.3	0.8	0.9	1.7	1	1	1
S[illegible]02-01	1,2-DICHLOROPROPANE	UG/KG	5.2	5.9	11	6.3	0.8	0.9	1.7	1	1	1
[illegible]02-01	1,3-DICHLOROBENZENE	UG/KG	NA	12	NA	6.3	NA	1.9	NA	NA	1	NA
SED02-01	1,4-DICHLOROBENZENE	UG/KG	NA	12	NA	6.3	NA	1.9	NA	NA	1	NA
SED02-01	2-BUTANONE	UG/KG	21	24	45	25	0.8	1.0	1.8	1	1	1
SED02-01	2-HEXANONE	UG/KG	21	24	45	25	0.8	1.0	1.8	1	1	1
SED02-01	4-METHYL-2-PENTANONE	UG/KG	21	24	45	25	0.8	1.0	1.8	1	1	1
SED02-01	ACETONE	UG/KG	33	24	45	25	1.3	1.0	1.8	1	1	1
SED02-01	BENZENE	UG/KG	5.2	5.9	11	6.3	0.8	0.9	1.7	1	1	1
SED02-01	BROMODICHLOROMETHANE	UG/KG	5.2	5.9	11	6.3	0.8	0.9	1.7	1	1	1
SED02-01	BROMOFORM	UG/KG	5.2	5.9	11	6.3	0.8	0.9	1.7	1	1	1
SED02-01	BROMOMETHANE	UG/KG	10	12	23	6.3	1.6	1.9	3.7	1	1	1
SED02-01	CARBON DISULFIDE	UG/KG	5.2	5.9	11	6.3	0.8	0.9	1.7	1	1	1
SED02-01	CARBON TETRACHLORIDE	UG/KG	5.2	5.9	11	6.3	0.8	0.9	1.7	1	1	1
SED02-01	CHLOROBENZENE	UG/KG	5.2	5.9	11	6.3	0.8	0.9	1.7	1	1	1
SED02-01	CHLOROETHANE	UG/KG	10	12	23	6.3	1.6	1.9	3.7	1	1	1
SED02-01	CHLOROFORM	UG/KG	5.2	5.9	11	6.3	0.8	0.9	1.7	1	1	1
SED02-01	CHLOROMETHANE	UG/KG	10	12	23	6.3	1.6	1.9	3.7	1	1	1
SED02-01	CIS-1,2-DICHLOROETHENE	UG/KG	2.6	6.2	5.7	3.2	0.8	1.9	1.8	1	1	1
SED02-01	CIS-1,3-DICHLOROPROPENE	UG/KG	5.2	5.9	11	6.3	0.8	0.9	1.7	1	1	1
SED02-01	CYCLOHEXANE	UG/KG	NA	NA	NA	13	NA	NA	NA	NA	NA	NA
SED02-01	DIBROMOCHLOROMETHANE	UG/KG	5.2	5.9	11	6.3	0.8	0.9	1.7	1	1	1
SED02-01	DICHLORODIFLUOROMETHANE	UG/KG	NA	NA	NA	6.3	NA	NA	NA	NA	NA	NA
SED02-01	ETHYLBENZENE	UG/KG	5.2	5.9	11	6.3	0.8	0.9	1.7	1	1	1
SED02-01	ISOPROPYLBENZENE	UG/KG	NA	NA	NA	6.3	NA	NA	NA	NA	NA	NA
SED02-01	METHYL ACETATE	UG/KG	NA	NA	NA	13	NA	NA	NA	NA	NA	NA
S[illegible]02-01	METHYL TERT-BUTYL ETHER	UG/KG	NA	NA	NA	25	NA	NA	NA	NA	NA	NA

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LE 4: Data Comparibility and Confirmation--Sediment VOCs

Gen ID	ANALYTE	UNITS	Fall 1999 Event	Fall 2000 Event	Fall 2001 Event	Q4 2003 Event	Ratio 1999/2003	Ratio 2000/2003	Ratio 2001/2003	Index Value 1999/2003	Index Value 2000/2003	Index Value 2001/2003
SED02-01	METHYLCYCLOHEXANE	UG/KG	NA	NA	NA	13	NA	NA	NA	NA	NA	NA
SED02-01	METHYLENE CHLORIDE	UG/KG	5.2	5.9	11	6.3	0.8	0.9	1.7	1	1	1
SED02-01	STYRENE	UG/KG	5.2	5.9	11	6.3	0.8	0.9	1.7	1	1	1
SED02-01	TETRACHLOROETHENE	UG/KG	5.2	5.9	11	3	1.7	2.0	3.7	1	1	1
SED02-01	TOLUENE	UG/KG	5.2	5.9	11	6.3	0.8	0.9	1.7	1	1	1
SED02-01	TRANS-1,2-DICHLOROETHENE	UG/KG	2.6	2.9	5.7	3.2	0.8	0.9	1.8	1	1	1
SED02-01	TRANS-1,3-DICHLOROPROPENE	UG/KG	5.2	5.9	11	6.3	0.8	0.9	1.7	1	1	1
SED02-01	TRICHLOROETHENE	UG/KG	5.2	5.9	11	6.3	0.8	0.9	1.7	1	1	1
SED02-01	TRICHLOROFLUOROMETHANE	UG/KG	NA	NA	NA	6.3	NA	NA	NA	NA	NA	NA
SED02-01	VINYL CHLORIDE	UG/KG	10	12	23	6.3	1.6	1.9	3.7	1	1	1
SED02-01	XYLENES (TOTAL)	UG/KG	10	5.9	23	6.3	1.6	0.9	3.7	1	1	1

APPENDIX IX

DETAILED DESCRIPTION OF THE HISTORICAL DATA

APPENDIX IX

DETAILED DESCRIPTION OF THE DATA THAT THE FACILITY IS SUMBITTING

The following is a detailed description of the data that the Facility is submitting for review. The location of the data review components identified in the US EPA's Region V QAPP guidance (US EPA, 1998) is presented in Table 1 of this technical memorandum, and is summarized in the discussion below. The description below is separated by media.

Ground Water

Ground water data was collected at and in the vicinity of the Facility during the Ohio VAP investigation. Ground water samples were collected for one of four purposes: 1) identification of contaminants of concern; 2) determination of the nature and extent of contaminants in ground water; 3) monitoring the effectiveness of pilot studies conducted at the Facility; and 4) monitoring the effectiveness of existing ground water interim measures. The complete analytical laboratory reports for all ground water data collected on and off of the Facility from 1998 to 2001 were provided in electronic form in the CCR in Appendix III.

<u>Ground Water Screening Samples</u>

Ground water screening samples were collected for the purpose of determining the optimum locations for monitoring wells on and off of the Facility, and to assist in determining the nature and extent of ground water contamination in the shallow portion of the Cedarville Aquifer. This data was collected directly from Geoprobe soil borings, and was analyzed for VOCs. Figure 25 and Table 36 of the CCR presents these sample locations and a summary of laboratory sample results, respectively. Table 2 of the CCR also presents a summary of laboratory data from ground water samples collected within Dayton Street between King Street and Wright Street. The water samples from this investigation were collected from one-inch temporary wells, and were analyzed for VOCs, SVOCs, PCBs, and pesticides. Ground water data from these investigations is considered to be Analytical Level II data since these samples were not collected from permanent monitoring wells.

<u>Nature and Extent of Ground Water Contamination</u>

Ground water samples were collected to determine the nature and extent of contamination from the existing monitoring well network on and off the Facility at that time. The locations of the monitoring wells were presented in the CCR on Figure 27. A summary of the ground water characterization monitoring events was presented in the CCR on Table 13. These monitoring events occurred at least on a semi-annual basis between November 1998 and November 2001. Ground water samples collected during this period were analyzed for VOCs, PAHs, RCRA metals, SVOCs, PCBs, pesticides, herbicides, and natural attenuation parameters (ethane, ethane, methane, manganese, iron, chloride, nitrate, sulfate, total alkalinity, TOC, and sulfide). The analytical laboratory data collected from these ground water monitoring events is Analytical Level III data. A summary of the ground water laboratory analytical results was presented in the CCR on Tables 25 through 32.

Pilot Study Ground Water Monitoring

Ground water samples were collected to monitor the effectiveness of pilot studies conducted during the Ohio VAP. A detailed description of the pilot studies that were implemented at the Facility is presented in Section 4.1.3 of the CCR. In April and May 1999, a pilot study was initiated at the Facility involving the in situ injection of a solution of potassium permanganate into the upper portion of the Cedarville Aquifer. The pilot study was conducted between Plant 2 and Plant 3, and consisted of one, four-inch injection well (RW01-01) and four monitoring wells (RW01-02 through RW01-05) that surround RW01-01. Ground water samples were collected from the injection well and four surrounding wells for VOCs and total and dissolved metals (total and hexavalent chromium, iron, potassium, and manganese). The ground water analytical laboratory data collected during this pilot study is Analytical Level III data. A summary of the ground water laboratory analytical data collected from these monitoring wells during the pilot study period was presented in the CCR on Table 6.

In February 2000, a second pilot study was conducted involving the in situ injection of a solution of potassium permanganate into storm sewer backfill materials located along the eastern portion of the Facility. Seven injection wells (STW01-01 through STW01-07) were installed adjacent to the storm sewer along the eastern Facility boundary. Figure 26 in the CCR presents the locations of these injection wells. Ground water samples were collected from the injection wells for VOCs. The ground water analytical laboratory data collected during this pilot study is Analytical Level III data. A summary of the ground water laboratory analytical data collected from these injection wells during the pilot study period was presented in the CCR on Table 7.

Interim Measures Ground Water Monitoring

Ground water samples were collected to monitor the effectiveness of ground water interim measures conducted at the Facility. A detailed description of the ground water interim measures conducted at the Facility is presented in Section 4.1.3 of the CCR. The ground water interim measures at the Facility include the Ground Water Capture Treatment System and the Utility Tunnel Sump Water Treatment System. Ground water samples were collected for VOCs from these interim measures, and a summary of the sample results were presented in the CCR on Tables 4 and 5. The ground water analytical laboratory data collected for these interim measures is Analytical Level III data.

Soil

A large volume of soil data was collected at and in the vicinity of the Facility during the Ohio VAP investigation. Soil data was collected for one of three purposes: 1) to determine of the nature and extent of soil contamination at the Facility, 2) to determine if VOCs have impacted any saturated sand lenses beneath the Facility and vicinity, and 3) to determine the geological properties of the unconsolidated deposits beneath the Facility.

The entire analytical laboratory reports for all soil data collected on and off of the Facility were provided in electronic form in the CCR in Appendix III. Table 12 in the CCR summarizes all soil borings and soil samples collected on and off of the Facility during the Ohio VAP. In general, soil boring locations on the Facility were biased to locations where contaminants may have entered into the subsurface. These areas include medium or high release potential SWMU or AOC locations as identified in the US EPA's PA/VSI report (TechLaw, 2001).

Nature and Extent of Soil Contamination

Laboratory data collected for the purpose of determining the nature and extent of soil contamination at the Facility was summarized on Tables 14 through 24 in the CCR. Soil samples that were collected for this purpose were analyzed for the following analytes: VOCs, SVOCs, RCRA metals, PAHs, PCBs, pesticides, herbicides, and TPH. The soil analytical data collected during this investigation is Analytical Level III data.

Saturated Sand Lenses Soil Sampling

Soil samples were collected from wet or saturated sand lenses beneath the Facility and vicinity when they were encountered to determine if VOCs have impacted any of the saturated sand lenses beneath the Facility. A summary of these samples is presented in Section 4.5.2.1 and Table 35 of the CCR. The soil data collected from the saturated sand lenses is Analytical Level III data.

Geological Properties Soil Sampling

Soil samples were also collected to assess the geological properties of the soil and rock beneath the Facility. This data includes moisture content, porosity, bulk density, permeability, specific gravity, TOC, and grain size analysis. A summary of this data is presented in Table 11 of the CCR. The soil data collected for this purpose is Analytical Level V data. The samples were analyzed by Bowser-Morner Geotechnical Laboratory, Dayton, Ohio.

Surface Water

Surface water was sampled at locations on and off of the Facility during the Ohio VAP investigation. Surface water samples were collected from available manhole locations of the main storm sewer on the Facility and along Dayton Street and Omar Circle. These locations are presented on Figure 21 in the CCR. Surface water samples were also collected at four locations in the unnamed creek located east of the Facility. These locations are presented on Figure 22 in the CCR. Surface water samples collected on or off of the Facility have been analyzed for VOCs, and are summarized on Table 33 in the CCR. The surface water data is Analytical Level III data. The entire analytical laboratory reports for all surface water data collected on and off of the Facility were provided in electronic form in the CCR in Appendix III.

Sediment

Sediment was sampled at six locations in the unnamed creek during the Ohio VAP. These sample locations are presented on Figure 22 in the CCR. The sediment samples were analyzed for VOCs and TOC, and are summarized on Table 34 in the CCR. The sediment data is Analytical Level III data. The entire analytical laboratory reports for all sediment data collected from the unnamed creek were provided in electronic form in the CCR in Appendix III.

Air

Six air samples were collected at the Facility at subsurface locations inside Plant 2 and Plant 3. These samples were analyzed for VOCs by US EPA Method TO-14. The data is Analytical Level III data. These samples were analyzed by STL's laboratory in Knoxville, Tennessee. The laboratory report for this data is presented in Appendix III of the CCR.